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THE
AMERICAN YEAR-BOOK

OF
MEDICINE AND SURGERY:

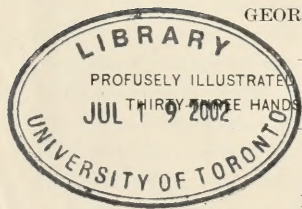
BEING
A YEARLY DIGEST OF SCIENTIFIC PROGRESS AND AUTHORITATIVE OPINION IN ALL BRANCHES OF MEDICINE AND SURGERY, DRAWN FROM JOURNALS, MONOGRAPHS, AND TEXT-BOOKS, OF THE LEADING AMERICAN AND FOREIGN AUTHORS AND INVESTIGATORS.

COLLECTED AND ARRANGED
WITH CRITICAL EDITORIAL COMMENTS

BY
J. M. BALDY, M.D., C. H. BURNETT, M.D., ARCHIBALD CHURCH, M.D.,
C. F. CLARKE, M.D., J. CHALMERS DACOSTA, M.D., W. A. N. DORLAND, M.D., V. P. GIBNEY, M.D., HOMER W. GIBNEY, M.D., HENRY A. GRIFFIN, M.D., JOHN GUITÉRAS, M.D., C. A. HAMANN, M.D.,
H. F. HANSELL, M.D., W. A. HARDAWAY, M.D., T. M. HARDIE,
B. A., M.B., C. F. HERSMAN, M.D., B. C. HIRST, M.D.,
E. FLETCHER INGALS, M.D., W. W. KEEN, M.D.,
H. LEFFMANN, M.D., V. H. NORRIE, M.D.,
H. J. PATRICK, M.D., WM. PEPPER, M.D.,
D. RIESMAN, M.D., LOUIS STARR, M.D.,
ALFRED STENGEL, M.D., G. N.
STEWART, M.D., THOMPSON
S. WESTCOTT, M.D.

UNDER THE GENERAL EDITORIAL CHARGE OF

GEORGE M. GOULD, M.D.



PROFUSELY ILLUSTRATED WITH NUMEROUS WOOD-CUTS IN TEXT AND
THIRTY-THREE HANDSOME HALF-TONE AND COLORED PLATES.

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PREFACE.

1. THE GENERAL DESIGN of this work is to give physicians in a compact form an annual epitome of the new and progressive medical truths or suggestions published during the months of the preceding year, from July to June, inclusive. It is at present almost or entirely impossible for the specialist, even as regards his one department, to keep himself conversant with the tremendous literature in all languages and in a thousand periodicals. How much more impossible is it for the general physician (or for the specialist) who desires to keep in touch with the most important advances made in all departments! It is confidently believed that no very significant fact has escaped review in the present pages; the material used has been not only the periodicals of the year, but also the often more important monographs, text-books, etc. It has been an onerous task to all concerned to condense this enormous mass of matter so that we could offer the product in a single volume. The making of medical books has become so prolific that both the expense and the library-space of the physician have become highly important considerations which we have kept steadily in view.

2. SHARP DISTINCTION has been made between a *summary of medical progress* and the *literary review of all published matter*. The latter problem we have not attempted. Thousands of excellent articles have not even been mentioned, because our task has not been to epitomize old knowledge, to review text-books (unless containing original research, new suggestions, etc.), or to abstract articles not written for the sake of new truth; we have aimed to mention only those things that are or may be contributory to the progress of medical science and art. It is sufficiently difficult for a busy physician to keep abreast of this sort of knowledge, without wasting his time in the repetition of old views or of knowledge already gained, or with publications solely for the writer's benefit.

3. SPECIAL TRAINING AND EXPERIENCE are necessary for the accurate choice of those things that are or may be in the line of true progress. Many new proposals are not new, many are not true, and ripe judgment is required to cull the things in each department that seem promising and worthy of

trial or of further consideration. The mere names of the departmental editors are sufficient guarantees of ability in this respect.

4. JUDICIAL CRITICISM is also desirable, not only to select and summarize, but also to pronounce decisions upon proposals, and to prevent useless experiment by others. A mere colorless, heterogeneous mass of abstracts from all medical literature leaves the average reader bewildered or in the position of an amateur experimenter. Without being too dogmatic, it has been the aim of the departmental editors to pronounce such needed judgment upon new suggestions or upon matters in dispute.

In the interest of much-needed brevity and simplicity there have been made a few slight innovations in spelling certain words, in the use of numbers, in the omission of diereses and hyphens, etc. For these I am to be held personally responsible.

It is with the profoundest regret that I have to chronicle the death, on Oct. 11, 1895, from nephritis, of Dr. Hersman, the colleague of Dr. Hardaway in the department of Dermatology. Charles Finley Hersman was born May 16, 1864. He received the degree of B. A. from the Westminster College, Fulton, Mo., in June, 1884, and was graduated with especial distinction from the Missouri Medical College in March, 1888. He was Interne at the St. Louis City Hospital for two years, House Physician of the St. Louis Polyclinic Hospital for about one year, and for three years Chief of the Skin-Clinic of the Missouri Medical College. At the time of his death he was Professor of Clinical Medicine in the Missouri Medical College. Dr. Hardaway speaks warmly of the versatility of his friend, of his nobility of character, and of his unflinching devotion to medical science even when conscious of approaching death.

It only remains for me to add a personal word of sincere gratitude for the unselfish cooperation, energy, and generosity displayed, often under great difficulties, by each of the editors and by the publisher. New knowledge very quickly becomes old in these days, and every reader is indebted to the unselfish zeal shown by each in speedily pushing his labors to completion, so that the resume of the year's work might be placed in the reader's hands before it had been staled by delay.

GEORGE M. GOULD.

PHILADELPHIA, December, 1895.

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GENERAL MEDICINE.

BY WILLIAM PEPPER, M. D., AND ALFRED STENGEL, M. D.,
OF PHILADELPHIA.

INFECTIOUS DISEASES.

TYPHOID FEVER.

In General.—The natural history of this disease has been so extensively studied and learned that little is added in the course of a year; but there are important questions regarding etiology and the details of treatment yet to be determined, and further statistical studies may be looked for with interest.

Etiology.—Numbers of food-stuffs have been found to be the carrier of the infection of this disease, but hitherto attention has not been directed to the following: A most interesting epidemic of typhoid fever was studied at Wesleyan College by Prof. Conn,¹ and traced to raw oysters as the vehicle carrying the infection. The epidemic lasted from Oct. 20 to Nov. 9, 1894, and in all 26 students were affected, of whom 4 died. It was found on investigation that no common source of infection had existed excepting at the fraternity-banquets held about two weeks before Oct. 20. All of the articles of food were considered, and it was found that the only foods coming from the same source and used at all the suppers were the celery, ham, a small amount of fruit, and raw oysters. Finally, it was possible to exclude each, excepting the oysters. Every one of the patients had eaten of the raw oysters, as had also several guests, of whom 4 at least developed the disease after returning to their homes at a distance. Subsequently it was learned that typhoid fever had also broken out among the members of a fraternity at Amherst College after a banquet on Oct. 12, at which raw oysters from the same source as those used at the Wesleyan suppers were consumed. These oysters had grown in the deep waters of Long Island Sound, but had been "fattened" in the shallow water of a creek at a point 300 feet below the outlet of a private sewer coming from a house where there were two cases of typhoid fever. [Every detail of this investigation was carried on with scrupulous care, and there is little doubt but that the infection was conveyed by the oysters.] A less elaborate contribution, but one that points in the same direction, was made by Broadbent,² who refers to 9 cases of typhoid

¹ Med. Rec., Dec. 15, 1894.

² Brit. Med. Jour., Jan. 12, 1895.

fever seen in consultation in which he believes the infection was conveyed by oysters.

The influence of personal predisposition and habits is illustrated by the interesting fact noted by Ross,¹ that in twenty-four years of practice in California he has never seen or heard of a case of typhoid fever among the many Chinese residing there. He attributes this to the exclusive use of boiled water in the tea and for drinking purposes.

The resistance of the virus of typhoid is shown to an extent by the relapses occurring often at considerable intervals after the original attack. It is still more definitely illustrated in the study of a case reported by Sultan,² in which persistent osteomyelitis of the clavicle followed after typhoid fever. The patient was a servant-girl of thirty-five years who had had severe typhoid fever that confined her to bed for eight weeks, and that was followed in a few weeks by a swelling in the region of the right clavicle. This burst spontaneously, discharging much pus. An abscess formed simultaneously at the angle of the ribs of the right side and reached the size of a child's head, finally breaking spontaneously. Repeated suppurations of this kind occurred in the same situation every few months. Six years later she came under observation of the author, having the same swelling in the region of the right clavicle, which was found to be an osteomyelitis with formation of sequestra. Typhoid bacilli in an active state were obtained from the pus, isolated, and cultivated. The author refers to instances in literature in which typhoid bacilli have maintained themselves for a year to eighteen months, but none of equal duration with his own case appears to have been reported.

Marian³ contributes a study of the question of intrauterine transmission of typhoid bacilli and of congenital typhoid fever. Before the era of the bacillus of Eberth some 10 cases are recorded of congenital typhoid fever, but of these the author justly remarks there must always remain a measure of doubt. After the Eberth-Gaffky contributions in 1884 a number of cases have been recorded in which the tissues of infants born of mothers having typhoid fever have been subjected to bacteriologic and pathologic study, with the discovery of the bacilli of the disease in question. In some cases the possibility of the bacilli being of the colon group was not considered, and some of the observations antedate the more accurate knowledge of the latter organisms. Still, the fact that several observers have shown the possibility of demonstrating true typhoid bacilli in the fetal tissues after infection of the mothers with cultures makes it likely that some at least of the observations are genuine. The lesions found in the fetus are enlargement of the liver and spleen; the intestinal and mesenteric gland-lesions are absent. Typhoid fever in the fetus is therefore a septicemia primarily, instead of secondarily as in the adult.

Symptoms.—The temperature in typhoid fever is dependent upon so

¹ *Occident Med. Times*, Feb., 1895.

² *Deutsch. med. Woch.*, Aug. 23, 1894.

³ *Rev. prat. d'Obstet. et de Padiat.*, Jan., 1895.

many conditions that alterations from the typical curve are not unusual. Raimondi,¹ for example, records a case in a child of eleven years in which the temperature sank to an excessively low point, reaching 35° C. on the third day, while the pulse sank to 44 per minute. The day previous the temperature had been 40.2°, and the general condition in the last three days had been growing worse. After seven days the temperature varied between 36° and 39°, then it fell to 32.8°, and finally to 31°. Three days later the patient died, and the autopsy revealed evidences of pneumonia which had not been discoverable during life, but the liver and spleen were enlarged and Peyer's patches were swollen in characteristic fashion.

Fisk² contributes some very interesting notes on cases of apparently abortive typhoid fever. He relates the clinical histories of 3 such cases, in 2 of which at least the diagnosis seems warranted. [He also details the histories of 2 cases of afebrile typhoid, though in 1 of these the diagnosis certainly lacks conclusiveness, and in neither is it stated whether the temperature was taken at frequent or long intervals.] The same author³ shows by composite charts of cases in the care of various physicians in Denver that the fever is not so high in that locality as elsewhere, judging by the typical curves as usually accepted. Another composite chart of 30 cases treated with careful regulation of the diet and avoidance of antipyretics shows even less pronounced fever than the cases taken at random where the treatment was less carefully regulated.

Anderson⁴ found among 915 cases of typhoid fever only 8 in which blue spots (*taches bleuâtres*) occurred. In 5 of these the spots were present when the patient entered the hospital, the time of this varying from the fifth to the fifteenth day. In the other cases they appeared several days later, on the fifteenth, twenty-first, and forty-second days respectively. The author can see no evidence in favor of regarding them as consequences of *pediculi*, as the marks were subcutaneous, were unaccompanied by other irritation or characteristic eruption, and in 3 cases at least developed while the patient was under conditions of strictest cleanliness. The fact that they have been observed over the course of the subcutaneous veins seems to him to indicate that they are due to some exudations from the vessels. [The experience of other authors by no means coincides with this, and in the cases under our own observation, in which strict examination was made, *pediculi* were always found.]

The prominence of the nervous symptoms in some cases of typhoid fever is such as to obscure the nature of the disease. An instance of this kind is reported by Aschaffembourg.⁵ A woman of thirty years entered the hospital in a state of such agitation and mental disorder that the diagnosis of typhoid fever was not established until the fifth day, when the nervous symptoms became less marked and the other symptoms became typical.

¹ *Gaz. des Hôpitaux*, No. 109, 1894.

² *Med. News*, Nov. 3, 1894.

³ *Ibid.*, July 14, 1894.

⁴ *Australian Med. Jour.*, Aug. 20, 1894.

⁵ *Archiv f. Neurol.*, March, 1895.

The patient died and the autopsy confirmed the diagnosis. The author has collected from literature 17 cases of early delirium in typhoid fever, and finds that in 7 of these the delirium preceded the fever. As a rule, it lasts but a few days, and presents itself under two forms, the first of which is not dissimilar from the general delirium occurring later in the disease. In the second form there is absolute confusion of ideas and action. Six of the 17 reported cases died.

An important contribution regarding the blood in typhoid fever has been published by Thayer.¹ He finds from his examinations that the number of red corpuscles and the amount of hemoglobin decline gradually until the defervescence, when there is a more rapid decline. The number of leukocytes also declines, reaching the lowest point at the time of defervescence. There is a relative increase of the large mononuclear forms. These changes in the number and character of the leukocytes are undoubtedly of some diagnostic importance.

Hewetson² has examined the urine in 229 cases of typhoid fever, as well as the kidneys in fatal cases. The presence of albumin, while frequent, is by no means constant. Generally it is found in traces, but there may be much albumin, with tube-casts and blood. This acute hemorrhagic type of nephritis may disappear completely, and is less frequently the cause of death than has been held. The lesions of the kidneys are degenerative and necrotic, as in other infectious fevers, and there may be associated lymphomatous nodules. These lesions may be due to the typhoid bacillus itself, or to other microorganisms that enter the circulation through the intestinal ulcers, or reach the kidneys from the lower urinary passages.

Diagnosis.—Potain,³ in considering the diagnosis of atypical cases of typhoid fever, points out that most of the usual symptoms may be absent, even the elevation of temperature itself. The most constant are the mental depression and the enlargement of the spleen. The latter is always present, though the postmortem does not always indicate this on account of the contraction which occurs after death. Its presence is best discovered by percussion, palpation in his hands having proved most unsatisfactory. The characteristic spots of the disease are not always present, but still, as a general rule, he holds that where the roseolæ have not appeared by the eighth or ninth day the diagnosis is very unlikely, and when none have appeared by the twelfth day typhoid fever may be excluded. [The diagnostic value of hypoleukocytosis and of the altered proportions of the different forms of the leukocytes has been alluded to above. The contributions regarding the diazoreaction are noted in the section on Disorders of the Urine.]

Complications and Sequels.—Roth⁴ cites statistics in relation to the frequency of nephritis in typhoid fever, and mentions the studies of Mygge, who examined the urine of 72 typhoid patients, finding albumin present in

¹ Johns Hopkins Hospital Reports, vol. iv., No. 1.

² Ibid.

³ Internat. klin. Rundsch., July 15, 1894.

⁴ Münch. med. Woch., March 12, 1895.

52. In half of these cases it was due to nephritis; in the other half to pyelitis or cystitis. The author refers particularly to cases in which the renal symptoms may be more marked than those referable to the gastrointestinal tract, and cites such a case occurring in a boy who was suddenly taken ill with headache, thirst, fever, and pain in the right side. On the fourth day there was scanty, dark-red, albuminous urine, containing numerous leukocytes, but no casts. The disease thus began as a pyelitis, and the diagnosis of typhoid fever could not be made until the eighth day. The author refers to the case as one of "nephrotyphus."

Robin and Lerrede¹ have studied the forms of typhoid fever complicated by rheumatoid affections of the joints, as well as instances of joint-troubles accompanied by symptoms of the typhoid state. They distinguish the following groups of cases: 1. Those in which the onset is marked by acute swelling and pain in the joints and the appearances of acute rheumatism, but in which the subsequent clinical course proclaims the disease to be in reality typhoid fever. These cases they call arthrotyphoid (analogous to pneumotyphoid). 2. Cases of typhoid fever in which rheumatoid swelling of the joints—always going on to suppuration—occurs in the later stages of the cases, and due to infection with the typhoid bacilli. 3. Septic disease of the joints in which the typhoid state marked by stupor and diarrhea are noted. 4. True articular rheumatism with the typhoid state. They deny the occurrence in any case of coincident typhoid infection and acute rheumatism.

Bewley² reports a case of violent cancrum oris in a boy of fourteen years, following typhoid fever. Pure oil of eucalyptus dropped on the slough was exceedingly useful in controlling the odor. Enormous quantities of whisky—6 pints in ten days—were given and well borne.

Weill³ among 35 cases of typhoid fever in infants noted desquamation of the skin in 27. This desquamation involved the trunk, the limbs, the neck, but neither the face nor the palms nor soles of the feet. The desquamation was sometimes mixed, furfuraceous upon the trunk and in strips upon the limbs. It occurred sometimes at the end of the febrile period, sometimes after the decline of the fever, and sometimes late in convalescence. The author regards it as due to a nutritive disturbance of the skin. It was not preceded by erythema, and baths had no effect to prevent it.

Coulon⁴ records a case of typhoid fever occurring in a child of ten and a half, in which there was widespread desquamation of the skin, scarlatiniform in character, during convalescence. There had been no eruption of the skin at all, and even the faintest eruption would surely have been noted, as the child was bathed with dilute vinegar. There was nothing to show that there had been scarlatinous infection, but the soreness of the throat, the albuminuria, and the edema were significant symptoms. Though admitting that

¹ Arch. gén. de Méd., Sept., 1894.

² Dublin Jour. of Med. Sci.; Pacif. Med. Jour., Oct., 1894.

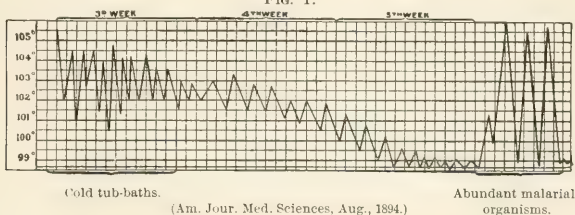
³ La Méd. infantile, Jan., 1895.

⁴ Ibid., Jan. 15, 1895.

this may have been an instance of typhoid fever attended with a masked scarlet fever, the author is rather inclined to view it as an instance of pure typhoid with desquamation, such as those alluded to by Weill.

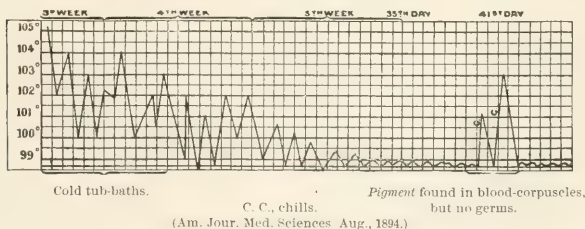
Gilman Thompson¹ details 3 cases of typhoid fever in which there was a coexisting malarial infection. In the first case, which seemed undoubtedly one of typhoid fever from the nose-bleed, headache, the course of the fever, the diarrhea, enlarged spleen, tympany, eruption, the general appearance of the patient, and finally intestinal hemorrhage, there occurred on the thirteenth day a marked chill, followed by fever mounting to 106.6° F. Two other chills occurred in the next week. Sudden reductions followed immediately upon the administration of quinin, and the malarial parasites were found in large numbers in the blood. The hemorrhages followed after the first chill, and did not seem to play a part in the sudden reductions of temperature noted. In the 2 other cases reported the malarial infection did not become active till the typhoid fever was practically completed, when the system of the patients seemed weakened sufficiently to allow the second infection to become prominent. In one plasmodia were found; in the other abundant pigment-particles. In both quinin was successfully employed.

FIG. 1.



[There is no evidence in these cases—and the author very properly remarks there is no other existing evidence—to prove that typhoid fever and malaria

FIG. 2.



ever conjoin to form a new and hybrid disease, such as Woodward describes under the name of typhomalaria.]

P. Miller² based a study of Texas typhoid or the so-called typhomalarial

¹ Am. Jour. Med. Sciences, Aug., 1894.

² Med. News, Feb. 23, 1895.

or slow fever upon 46 cases observed by himself and 84 by Copward in the same epidemic. From this study it appears that the disease in question resembles typhoid in all particulars, especially in the fever, splenic enlargement, and intestinal manifestations, and differs only in the absence of spots and of nose-bleed, neither of which were ever observed. In 1 case autopsy revealed characteristic typhoid ulcers.

Silvestrini¹ records 2 cases of typhoid fever in which facial erysipelas supervened, and in which the most careful examination failed to reveal the presence of streptococci, but only the bacilli of typhoid. Klebs and Reiner are said to have made similar observations.

Boulay and Mendel² record the occurrence of paralysis of the vocal cord following typhoid fever. In the case reported by them this affected entirely the adductor muscles, was developed very slowly, and gradually subsided. A search through literature discovered 10 further cases accurately described and 3 cursorily mentioned. In some there was total paralysis of the recurrent nerve and some palsy of the adductor, and in others paralysis of the posticus. The pathologic cause seems undoubtedly neuritis.

Statistical Contributions.—Wightman³ analyzes 24 cases of typhoid fever occurring in children under thirteen years of age. He found enlargement of the spleen in 8 cases, typical spots in 15 cases; and, as far as the intestinal symptoms were concerned, 10 were constipated, in 3 only were the characteristic discharges noted, while in 8 there was looseness, but not of the typical character. Three of the cases died—1 of pyemia secondary to necrosis of one of the phalanges, 1 of perforative peritonitis, and 1 of simple exhaustion.

Ssokolow⁴ tabulates 581 cases of typhoid fever occurring in childhood, and deduces certain interesting facts. The majority of cases occurred from the fourth to the tenth year. Abortive forms occurred in 4.3 per cent., mild attacks in 26 per cent., ordinary in 51 per cent., and severe cases in 18 per cent. of all. In 3.6 per cent. of the cases there was rapid onset with vomiting, and in 3.2 per cent. with chill. The cases in which constipation existed were milder and shorter in duration than those in which the reverse occurred, and the mortality was decidedly different—in the former 1.8 per cent.; in cases in which there was diarrhea, 10 per cent. Fever occurred during convalescence in 37 per cent. of all, but relapses were less common than in adults.

Zenetz⁵ contributes a statistical study of relapses in typhoid fever. Among 384 cases there were 47 in which relapses occurred, and of these 17 were entirely uncomplicated. He notes an important point that in cases in which relapses afterward occur there is a continued loss of weight after the decline of the fever, or at least no tendency to regain the lost weight. From this and from other studies he maintains that cases in which relapse occurs

¹ *Riforma Med.*, 1894, 196, 197.

² *Archiv. gén. de Méd.*, Dec., 1894.

³ *Brit. Med. Jour.*, May 5, 1894.

⁴ *Centralbl. f. Innere Med.*, May 18, 1895.

⁵ *Wien. med. Woch.*, Sept. 1, 1894.

have really never recovered from the disease, and that there is not a reinfection. He asserts that a case of typhoid fever is never free of danger of relapse until a time equal to that of the entire febrile period has passed during which the temperature has been normal.

Osler¹ reports 229 cases of typhoid fever, with 22 deaths, a mortality of 9.6 per cent. Since the introduction of tub-bathing the mortality has been 7.1 per cent. The rash occurred in 86.9 per cent. of the cases, and was petechial in 10 cases. Diffuse erythema occurred in 7 cases. The fever exceeded 106° in 8 cases, of which 4 died. The pulse was below 120 in but 1 fatal case; in the others it varied from 129 to 160 or more. Heart murmurs were often present, but there was no case of endocarditis. Phlebitis occurred but twice. The bowels were loose in 33.2 per cent. of all cases, while in the fatal cases there was slight diarrhea in 7, profuse in 10, and none at all in 5. It was possible to feel the spleen below the ribs in 147 cases—64.1 per cent. Relapse occurred in 7.8 per cent. In 1 case the patient had malaria on admission to the hospital, and afterward developed a typical case of typhoid fever; but in no case were the two diseases coincident. An interesting complication was present in a number of the bathed cases. It was a distressing acroparesthesia, in the form of an exquisite sensitiveness of the toes and sometimes of the soles and dorsa of the feet.

Berg² has analyzed 1626 cases of typhoid fever occurring in Curschmann's clinic at Leipzig from 1880 to 1892. In this number there was but one instance where a second attack of the disease was positively determined. Relapses occurred in 12 per cent. of all cases, and in one instance as late as the seventy-seventh day after the temperature had become normal. The eruption was undoubted in 80.4 per cent. and questionable in 5.6 per cent. Diarrhea was present in 25.6 per cent., constipation in 16.4, and there were intestinal hemorrhages in 5.5 per cent. Regarding the complications, pneumonia occurred in 8.9 per cent.; bronchitis in two-thirds of all; perforation of the intestine in 2.2 per cent. of the cases. Febrile albuminuria was present in 11.3 per cent., and actual nephritis in 2.8 per cent. of the cases.

Zinn³ analyzes the cases of typhoid fever occurring at the hospital at Nuremberg. The total number of cases in the last five years was 190—considerably less than the usual proportion compared to the total number of cases in the hospital. Among the points of interest may be noted that the characteristic spots occurred in 72 per cent. of the cases, and that as far as was possible to estimate they appeared most frequently about the eighth day. Enlargement of the spleen occurred in 94 per cent., bronchitis in 62 per cent., Erlich's diazoreaction in 78 per cent. of the cases. Distinct eruption of herpes was found in 5 per cent. of all the cases, albuminuria in 31 per cent., and casts of hyaline and epithelial character in 13 per cent. Complications occurred in 17 per cent., and relapses in 22 per cent. Regarding the bacteriologic diagnosis, he states that during the last two years careful exam-

¹ Johns Hopkins Hosp. Reports, vol. iv., No. 1.

² Deutsch. Arch. f. klin. Med., April, 1895. ³ Münch. med. Woch., May 21, 1895.

inations have been made of the dejections, but with very few satisfactory results. In the postmortem examination of the fatal cases it is interesting to note that 6 presented fresh miliary tuberculosis of the lung in association with older foci at the apex. Regarding treatment, the experience of these years confirms the distrust of antipyretics, and in particular of lactophenin, and the favorable opinion entertained regarding bathing, with possibly the administration of quinin.

Prognosis.—The varying mortality in different epidemics and at different periods of the same outbreak is noted by Lancereaux.¹ He shows that in the great epidemics of typhoid fever that occurred in Paris in 1876, 1882, and 1894 sections of the city supplied by water from distinct sources were affected. In that of 1882, indeed, the disease began two weeks after the affected area was supplied with water from an unusual source on account of the insufficiency of the ordinary supply. An observation which shows the unreliability of statistics was made in the first outbreak studied, in which he saw no fatal cases during the first six months, whereas in the next six months the mortality ranged from 35 to 40 per cent.

Treatment.—The value of the cold-water treatment is referred to by most of the statistical writers, and may be regarded as the established and accepted therapeutic procedure. Variations and even the withdrawal of the treatment may be required in individual cases, however. Le Gendre² in an elaborate article objects to the indiscriminate use of cold water as the sole treatment of the disease. He considers in detail each point in the disease, describing the appropriate treatment. At the beginning he would use calomel, either in one dose of $7\frac{1}{2}$ to 15 gr., or in smaller doses of $1\frac{1}{2}$ gr. every hour. Each morning and evening the intestine is irrigated with a quart of boiled water saturated with boric acid or with naphthol (3 gr.). For intestinal antiseptis he lauds benzonaphthol, to which may be added subnitrate or salicylate of bismuth if diarrhea is present. From 35 to 75 gr. of the naphthol should be given in ten or twelve doses in the twenty-four hours. For cardiac weakness he advises alcohol with coffee, or, if myocarditis be present, caffeine; injections of ether should be insisted upon. The cold-water treatment is not as well borne by women as by men, and may give rise to hysteric attacks. In pregnant and puerperal women he³ believes the treatment may be of great service. Abortion and miscarriage may often be prevented in the former state by judicious bathing. If the temperature is moderately high, the bath may be gradually cooled; if hyperpyrexia is present, cold baths must be at once employed. Quinin should not be given to pregnant women. In the puerperal state, unless there is peritonitis, cold bathing should be employed, and quinin may be given at the same time. Noyes⁴ has found tub-bathing easy by using the pillows as an embankment about the patient, and slipping a rubber sheet under him and over the pillows at the sides, head,

¹ *Gaz. des Hôpit.*, No. 55, 1894. ² *Jour. de Méd. et de Chir. prat.*, p. 161, 1895.

³ *Therap. de la Fievre typh.*, Paris, 1895, and *Rev. prat. d'Obst. et de Pédiat.*, Feb., 1895.

⁴ *Buffalo Med. and Surg. Jour.*, Sept., 1894.

and feet. Burr¹ suggests a convenient method of using tub-baths in private practice. He has had constructed a light frame of poplar 6 feet 2 inches long, 2 feet wide, and 8 inches deep, which may be folded up for easy transportation. This is put about the patient after a rubber sheet has been placed under him. The rubber sheet is then drawn up around the patient and made fast over the frame. The patient is thus made to lie in an improvised bath without having been disturbed. Water is now allowed to flow into the bath, and after completion of the operation the water may be siphoned out, the frame removed, the rubber thoroughly dried, and slipped from beneath the patient.

Glax² claims from a study of 53 cases of typhoid fever that there is a retention of water during the continuance of the fever and increased discharge during the convalescence. The retention is due to decreased blood-pressure, and is therefore proportionate to the weakness of the heart. He combats the flushing treatment of Cantani and Sahli.

Fernet and Martin³ advocate the use of the electric currents to reduce intestinal distention in typhoid fever, and refer to an observation illustrating its usefulness. One pole is placed over the abdomen, the other over the back, and the current of six milliampères is used. One or two applications a day suffice. [It may be objected to this treatment that there is danger of intestinal perforation from vigorous stimulation of peristalsis.]

[The efforts to establish a rational treatment of typhoid fever based upon the present views regarding infectious and antitoxic substances have thus far been signally unsuccessful.]

V. Jaksch⁴ reports that in a series of cases of typhoid fever in which injections of blood-serum from convalescent patients were made no influence on the disease was noticeable. On the other hand, Legrain⁵ treated 12 cases of typhoid fever by injections of serum from convalescent patients. The epidemic during which his observations were made was severe and the cases treated were marked ones. He claims that the effect of the injections was noticeably favorable. There was a regular fall of temperature; the nervous symptoms and general condition improved; and all of the cases recovered, while the general mortality of the epidemic was 25 per cent. Hughes and Carter⁶ have injected 2 cases of typhoid fever with blood-serum of convalescent patients, and found improvement follow, possibly in consequence of the injection. The duration of the cases was eighteen and twenty-two days. Both were quite mild. Girard⁷ records a case of typhoid fever with high temperature, considerable diarrhea, profuse sweating, and deep unconsciousness, in which dissolution seemed imminent. The patient was treated by subcutaneous injections of serum obtained from a blister which was raised on a convalescent case of typical typhoid fever. Eight c.cm. of this serum were

¹ Chicago Med. Recorder, Oct., 1894.

² Centralbl. für Innere Med., No. 6, 1895.

³ Gaz. des Hôpitaux, No. 10, 1895.

⁴ Centralbl. f. Innere Med., May 25, 1895.

⁵ Compt. rend. de la Soc. de Biol., Jan. 19, 1895.

⁶ Ther. Gaz., June 15, 1894.

⁷ Jour. Am. Med. Assoc., Oct. 27, 1894.

introduced into the patient. There was no immediate and striking effect, but gradually consciousness returned and the patient improved. Lambert¹ has treated 28 cases of typhoid fever by injection of thymus-extract inoculated with typhoid bacilli. He found improvement in 15, which he thought attributable to the injections, while in the remaining cases there was no improvement that could be ascribed to the treatment. The first group of cases came under treatment on the tenth day on the average, while the second were not treated until the fifteenth day on the average.

Rumpf² records 65 cases of typhoid fever treated by injections of dead culture of *Bacillus pyocyaneus*. In 13 to 20 per cent. of the cases no effect whatever was observed, while in the rest each injection was followed by an increase and then a greater decrease of fever. In a number the fever seemed to be removed entirely in this way. Now and then slight renewal of the fever occurred after the first fall of temperature. Kraus and Buswell³ found in a study of 12 cases treated with heated cultures of *B. pyocyaneus* that there was practically no result as far as influence upon the course of the disease is concerned. In 2 cases which ended fatally relapses occurred during the treatment.

Yeo⁴ advocates attention to intestinal antiseptics in the treatment of fevers, particularly in typhoid fever. The remedy he uses is chlorin-water prepared as follows: Into a 12-ounce bottle put 30 grains of potassium chlorate, and add 60 minims of strong hydrochloric acid. Close the bottle with a cork and agitate gently till the bottle is filled with gas; then add water little by little, closing the bottle each time and agitating it until it is filled. Add 24 or 36 grains of quinin and some syrup of orange-peel to flavor the mixture. To adults 1 ounce is given every two to four hours. He has used this treatment during ten years with the happiest results, finding that the tongue and mouth soon become clear, the evacuations less offensive, the fever lower, and the strength and intellectual clearness greatly improved. Broadbent in his Cavendish Lecture,⁵ while recognizing the impossibility of introducing any antiseptic remedy into the blood in sufficient quantity in typhoid fever to destroy the microorganisms without serious consequences, recommends the use of mercuric chlorid or calomel as an intestinal antiseptic useful to prevent the formation and absorption of ptomaines due to other microorganisms. In regard to the treatment of the pyrexia he commends the method of continuous immersion of Barr of Liverpool. He refers also to 2 cases of intestinal perforation in his experience in which recovery ensued.

Wedgwood,⁶ Crowe,⁷ and Ewart⁸ attest to the value of mercuric chlorid and iron in the treatment of typhoid fever. Wedgwood, who was the first to call particular attention to this combination of remedies, used a mixture

¹ N. Y. Med. Jour.

² Wien. klin. Woch., 1894, No. 28.

³ Med. Press and Circ., Aug. 22, 1894.

⁴ Ibid., 1894, ii, p. 1302.

⁵ Centralbl. f. Innere Med., No. 21, 1895.

⁶ Am. Jour. Med. Sci., June, 1894.

⁷ Brit. Med. Jour., ii, 1894, p. 1126.

⁸ Med. Press and Circ., May 15, 1895.

of the iron perchlorid and the mercury perchlorid every four hours steadily throughout the attack. All of the cases recovered; in none was the temperature above 104° ; diarrhea was slight; hemorrhage did not occur; there were no complications; and none of the cases presented fever beyond the third week. The other two observers bear out these very flattering observations.

Quill¹ reports excellent results from the use of a mixture of chloroform and phenol in the treatment of typhoid fever.

Billings of Chicago² advocates the continued use of small doses of strychnin throughout typhoid fever to obviate the danger of cardiac atony. The Brand treatment also seems to prevent serious cardiac failure in many cases, and should be considered a part of the treatment for cardiac asthenia.

TYPHUS FEVER.

Dubief and Bruhl³ record interesting studies of typhus fever made in an epidemic that occurred in 1893. Postmortem they found the most suggestive lesions in the respiratory organs, consisting of swelling and mucous exudation of the pharynx, nasopharynx, and larynx. There was also a special form of pneumonia with hemorrhagic and cellular, but not purulent, infiltration, as well as capillary hemorrhages. The authors regard the disease as an infection primarily of the respiratory tract in which toxins are produced causing the general symptoms. They have isolated from the blood and from the exudates alluded to a specific diplococcus which they regard as the cause of the disease.

ERYSIPELAS.

Zeller and Arnold⁴ jointly report the clinical and pathologic features of an interesting case that is probably unique. Following after a relapse of erysipelas in a young woman of twenty-two years, there developed peculiar black abscesses and furuncles. In the course of a year and a quarter about 650 of these were noted, affecting all parts of the body, including the hairy scalp. Fever amounting to 100° and more, but without distinct relation to the abscess-formation, was observed. There was little depression of the general health, and the termination was complete cure. The abscesses were confined to the skin and subcutaneous tissues, and varied in size from that of a millet-seed to that of a large nut, and were marked by formation of gas in their center and by the dark pigmentation. Anatomically, Arnold found melanosis of the connective and elastic tissue-fibers, the wall of the fat-cells and of the blood-vessels, as well as of the contents of the blood-vessels, particularly the red corpuscles. Bacteriologic examination showed streptococci and indefinite cocci and bacilli.

Massalunga⁵ records a case of recurring erysipelas in a young woman of

¹ Brit. Med. Jour., April 28, 1894.

² Chicago Med. Recorder, Nov., 1894.

³ Archiv. de Méd. experi., 1894, No. 2.

⁴ Virchow's Archiv, vol. cxxxix., Heft 2.

⁵ Riforma Med., No. 229, 1894.

twenty-two years. The disease first occurred at the sixteenth year, when she was ill with it for several months. After the establishment of the menses in the seventeenth year the disease recurred with each menstruation, there having been, in all, some 60 attacks. The attacks occurred invariably on the first, second, or third day. The author's theory is that the virus of the disease is retained in the tissues, probably in the lymph-spaces, and becomes active when the system is rendered susceptible. In proof of this he cites the experiments of Roger and Ochotine, which proved that experimental erysipelas in guinea-pigs is more rapidly developed and more virulent when the upper sympathetic ganglion of the same side has been extirpated, with resulting disturbance of the circulation.

Roger¹ shows that many of the inflammatory complications of erysipelas are mainly due to secondary infection with pneumococci. He treats mainly of the pulmonary, peritoneal, and meningeal complications. The pneumonic in particular are interesting. Their onset is insidious and marked by increase of the general symptoms; these are dyspnea, sweating, and occasionally purulent expectoration; and the course is rapid, ending in resolution or death. There is a special tendency for the disease to attack the seemingly vigorous and young. The onset does not affect the existing temperature much; the disease affects the right base and presents the lesions of bronchopneumonia. The author believes the erysipelas predisposes by lowering vitality.

Anders² insists on the value of generous diet in erysipelas, and believes the typhoid state developed in this disease often the result of hyponutrition. He repeats some of the statistical deductions of a previous paper, based on the experience in several hospitals of Philadelphia. In the Pennsylvania Hospital, from 1872 to 1876, 74 cases occurred, and were treated with tincture of the chlorid of iron alone, and there were 3 deaths (4 per cent.). From 1877 to 1892, 66 cases occurred, in which iron alone was used, and of these but 1 died; this lesser mortality was due to the fact that iron was used only in the milder cases during this period. There were 26 cases, some with severe complications, treated with pilocarpin and occasionally with quinin, and none died. [In other hospitals of Philadelphia iron and quinin have been used with about the same mortality.]

Barr³ concludes from the study of 40 cases of erysipelas treated by hypodermic injections of pilocarpin that this remedy possesses marked influence on this disease.

Renoy and Bolognese⁴ report extensive observations on the abortive treatment of erysipelas with local applications of ichthyol and traumaticin. The method succeeded in about 60 per cent. of the cases.

VACCINIA.

[The opinion is now quite generally held that this disease is identical with variola in nature, but certain investigators remain skeptical.] Cope-

¹ *Revue de Méd.*, April, 1895.

³ *Ibid.*, May, 1894.

² *Therap. Gaz.*, July, 1894.

⁴ *Bull. gén. de Thér.*, Feb. 28, 1895.

man¹ contributes some important investigations which go to show their complete identity. Both diseases are communicable to monkeys, and when an animal has passed through one it is protected from the other. He supports his view by admirable illustrations of the eruption in the two diseases. Depuy,² on the other hand, maintains that the identity of these diseases is not yet certainly established. Ruffer and Plimmer³ in their studies of vaccinia-pustules from man, the cow, the monkey, and rabbit, as well as of small-pox lesions of the skin and larynx, find the constant presence of a protozoan organism such as has been described by Guarnieri and Monti. [Whether these are the cause of the diseases in question or not, the occurrence of the same parasite in the two is of interest as giving confirmation to the view expressed that vaccinia and small-pox are identical diseases.]

Regarding the value of vaccination in the prevention of small-pox a number of authors contribute statistical papers. Morton,⁴ Hunt,⁵ McCollom,⁶ and Goldschmidt⁷ all contribute papers showing the value of vaccination and revaccination in the prevention of small-pox and in the effect it exercises upon the attacks that do occur. Morton refers particularly to the statistics of Welch of Philadelphia, which show that the death-rate among 5000 persons was 58 per cent. for the unvaccinated, and but 16 per cent. for the vaccinated. The same observer states that in twenty-three years' service in the small-pox hospital he had never seen a case in any of the attendants who had been properly revaccinated on entrance into the hospital. Almost equally favorable reports were obtained at the Homerton Fever Hospital and in the investigation of nurses instituted by the Epidemiologic Society of England. McCollom refers particularly to the statistics of Boston, and shows that while from 1721 to 1792 there were 3 severe and fatal epidemics, there have been no comparable outbreaks since that time. The epidemic of 1872-73 was very mild in comparison. Since April, 1881, there have been in Boston 217 cases of the disease, of whom 121 were vaccinated and 96 showed no sign of vaccination. Of the former, none died; of the latter, 50 died and 46 recovered.

Goldschmidt cites interesting statistics from Germany, among which may be noted those showing that the number of deaths per 100,000 in that country, where vaccination is compulsory, varies from 1.11 to 1.68, whereas in Paris, London, and Vienna, where it is either optional or only once compulsory, the number of deaths is from 25.50 to 84.37. Further statistics show the decided necessity of revaccination, since from 85 to 90 per cent. of persons vaccinated lose the acquired immunity in the twenty years following the successful vaccination. Stumpf⁸ publishes the official statistics of vaccination and revaccination in Bavaria. Of 137,420 persons vaccinated for the first time, there were only 1431 failures. Among 122,157 revaccinated, there

¹ Jour. of Path. and Bacteriol., vol. ii. p. 407.

² Thèse de Paris, 1894.

³ Brit. Med. Jour., Jan. 30, 1895.

⁴ Jour. Am. Med. Assoc., June 16, 1894.

⁵ Ibid., Aug. 25, 1894.

⁶ Boston Med. and Surg. Jour., Sept. 6, 1894.

⁷ Jour. Am. Med. Assoc.

⁸ Münch. med. Woch., Nov. 27, 1894.

were 2557 failures at the first time, 489 at the second, and 242 at the third. Dubousquet and Jasiewicz¹ in their revaccinations of school-children found the proportion of successes to be 26 per cent. among the girls. A point of note was the greater proportion of successes obtained in the younger girls, from six to eight, than in those from eight to twelve, and they ascribe this to the greater susceptibility of the younger children. Among the boys this was not the case, but, despite that fact, they still hold to the point of fact and to the explanation in view of their previous experiences.

Ortega² points out that in the epidemic of small-pox occurring in Mexico in 1890 the greater efficiency of vaccination by *piqûre* over the ordinary scraping method was very apparent. Many cases apparently successfully vaccinated in the latter way contracted small-pox or responded to revaccination, while neither of these was common after previous performance of the method of puncture. The pustules occurring in the scraping method he thinks are due to ordinary septic infection.

VARIOLA.

Ost³ analyzes cases of small-pox coming under his observation during a series of years, and details some interesting observations. One point of special interest was the fact that 3 persons who had occupied the same room three days and three nights with a patient having small-pox, and had stayed a day and a night in an infected room without acquiring the disease, were afterward successfully vaccinated.

Moore of Dublin⁴ records a case of small-pox in which the beneficial effects of red light secured by red curtains and hangings was apparent, and refers to the recent revival of this ancient method of treatment. It was first suggested by John of Gaddesden, a court physician in the fourteenth century. The irritability of the eyes and even the condition of the eruption is beneficially influenced. [The effect of the different light, heat, and chemic rays upon the growth of bacteria has not yet been positively determined; but the beneficial effect of cutting off certain rays in certain forms of skin diseases has been quite satisfactorily established.] Moir,⁵ in criticism of recent contributions regarding the beneficial influence of the cutting off of the chemic rays of daylight from patients suffering with small-pox, states that, on the contrary, his experience warrants the belief that full sunlight exercises a distinct bactericidal or other desirable action. The eyes alone require protection from light.

Kinyoun⁶ has reported the results of the employment of the blood-serum of a calf vaccinated four weeks previously in the treatment of two cases of small-pox. Fifteen c.cm. of the serum were injected under the skin, and again after the lapse of eight or ten hours. In the one case 4, in the other 7,

¹ Jour. de Méd. de Paris, 1895, p. 74.

² Bull. gén. de Thérap., 1894, p. 369.

³ Mittheil. aus Klin. und Med. Instit. der Schweiz, ii. Reihe, Heft v.

⁴ Dublin Jour. of Med. Science, Dec., 1894.

⁵ Lancet, September 29, 1894.

⁶ Med. News, Feb. 2, 1895.

injections were made. He believes that the serum exercised a mitigating influence, and, though one case died, a prolongation of life seemed to have been brought about.

Landmann,¹ in an investigation regarding the influence upon small-pox of the injection of variola-serum (obtained on the twenty-seventh day after onset of the disease) and of vaccinia-serum (obtained on the fifth day after vaccination in an animal), finds no appreciable influence upon the course of the disease in question. The injection of variola-serum (six weeks and six months respectively after recovery) in proportion of 1 to 800 had no protective influence upon vaccinia; nor had vaccinia-serum in the proportion of 1 to 800 upon the same disease.

MALARIAL FEVER.

Di Mattei² asserts that malarial infection may be brought about by both intravenous and subcutaneous injection of blood from diseased persons. The time of incubation varies from ten to fourteen days as a rule. Tertian, quartan, and irregular fevers are due to three different parasites; the same parasite always reproduces the same type. It was impossible to produce the disease in any animal, including monkeys. The parasites found in birds by Danilewsky has analogies with the malarial, but is essentially different. They cannot be made to grow in the human body; they are not affected by quinin or arsenic. Four additional cases of successful inoculation of this disease are reported from the clinic of Prof. Bacelli at Rome, two by Gualdi and Antolisei,³ and two by Antilosei and Angelini.⁴

The question of the life-history of the malarial parasite outside the human body has not as yet received solution, but Manson⁵ in a deductive manner seeks to indicate the possible forms of the parasite outside the body and its manner of egress. He reviews the facts that have been determined positively regarding the malarial parasite, and notes, in the first place, that the flagellated form is not seen immediately after the blood is withdrawn, but appears in the slide after some minutes—generally not before a quarter of an hour. The flagellated form therefore does not exist as such in the circulation. It has been found that it is formed in two ways: first from the crescentic organisms, and second from certain of large intracorpuseular ameboid forms. The crescent form is the principal source, and these crescents are known to be resistant to the usual method of removal of foreign bodies from the blood; that is, they are not attacked by the phagocytes. It would seem, therefore, that it is a stage in the life of the parasite designed to protect it; and, as the flagellate form is only produced in the blood after removal from the body, this would seem to be the first stage in the further development of the organisms in the outer world. As to the removal, Manson believes that

¹ Zeit. f. Hygiene und Infektionskrank., xviii. p. 318.

² Archiv f. Hygiene, Bd. xxii. H. 3.

³ Studien über Malaria, Bacelli, Berlin, 1895, p. 101.

⁴ Ibid., p. 103.

⁵ Brit. Med. Jour., Dec. 8, 1894.

mosquitoes and other suctorial insects are probably the means of this removal.

J. S. Billings, Jr.,¹ in a study of the leukocytes in malarial fever finds that in the tertian type there is a constant decrease in their number. There is, however, two or three hours after the chill, a distinct increase; subsequently the number falls below the normal when the paroxysm has been completed. The number is slightly increased during the intervals between the paroxysms. In quartan malarial there is no such regularity, though there would seem to be a decrease in the leukocytes toward the end of the paroxysm in this also.

Guice² calls attention to the clinical features of chronic malaria as he has seen it. It occurs most commonly in intermittent paroxysms of fever or some other manifestation. In one of his cases there appeared each day a sudden painless swelling of one side of the face. The majority of cases occur before the age of twenty. In regard to treatment he holds that calomel is contraindicated. This is certainly true of the large doses frequently used in this country. The persistent use of tonic mixtures, containing especially arsenic and quinin, is the proper treatment.

A most interesting contribution on the pernicious malaria of Eastern Africa has been published by Steudel.³ Pernicious malaria as it occurs in that country usually takes the form variously known as *fièvre bilieuse hématurique*, *black-water fever*, and *gallen fieber*, respectively, in French, English, and German. The author details the clinical histories of 16 cases. As to the etiology, he observes that unwholesome dwellings play the most prominent part, and in several cases he was able to confirm the popular belief that Europeans are especially liable on returning to the coast after interior expeditions. In 2 cases there was a possibility, if not probability, of infection by drinking-water, and not, as is customary, through the lungs. Few cases occur before the expiration of half a year after arrival in the infected area. Previously, ordinary forms of malarial fever occur, and the first attack of the pernicious type may not occur for as much as seven years after residence. The onset follows latent or masked malarial disease, the latter mainly characterized by anemia, splenic tumor, and nervous excitability. The real onset is sudden, with severe chills (these are unusual in the ordinary malaria of Eastern Africa). The temperature varies from 40° to 42° C. The patient is extremely prostrated, and sweats copiously. Some remission of the temperature occurs after the first day. Vomiting, pain over the liver without much enlargement, jaundice, great enlargement of the spleen, and dark-colored often blackish-green discoloration of the urine are the characteristic symptoms. Intense anemia marks the case and leads to the later symptoms. The proper treatment, he finds, is free administration of quinia by the *mouth*, from 8 to 10 g. per day. Antipyrin and similar remedies should not be used if it is possible to avoid them. The mortality in his experience was 16

¹ Bulletin Johns Hopkins Hospital, vol. v., No. 42.

² Virgin. Med. Monthly, July, 1894.

³ Vogel, Leipsic, 1894.

or 17 per cent., whereas it is commonly believed to be about 70 per cent. under ordinary treatment. As a prophylactic quinin should be taken to the extent of 0.8 to 1.0 g. on one day during the week of the dry season, and twice weekly during the rainy season. He has seen few cases of comatose or convulsive pernicious malaria in that country.

Schiess-Bey and Bitter¹ in a preliminary communication state that they have found in a number of cases of the disease known as bilious typhoid, occurring at various points along the Mediterranean, organisms in the blood that resemble closely those of malaria. They found these to possess the same tendency to invade the red corpuscles, to grow larger and larger until the red corpuscle was filled, and finally to divide into oval spores which extrude and reenter red corpuscles. Griessinger, and latterly Koch during his visit to Egypt, also regarded the disease as malarial in nature.

Treatment.—Brodnax² has found acetanilid a useful remedy to abort the chills of malarial fever. He administers the remedy in doses of gr. vj, and finds a pleasant sudorific effect and cessation of the chill and fever.

Danowski³ reports very favorable results from the use of methyl-blue in malaria, 10 cases out of 11 terminating in complete cure. He used doses of $7\frac{1}{2}$ grains, and always continued the treatment for forty-eight hours at a time, so as to subject the plasmodia at every stage of their development to the action of the drug.

Forbes⁴ in some notes on the prevention and treatment of malaria in intensely malarial climates says that in his Indian and African experience quinin has proved useless as a prophylactic, and worse than useless in acute forms of the disease. He recommends for the former purpose, besides hygienic regulations, free doses of opium. The effect of the latter he ascribes to some bactericidal principle contained. He would use the same remedy as a curative of the attacks themselves. As an antipyretic and anodyne antipyrin ranks first, excepting in the remittents, in which tincture of aconite is even more efficient. Warburg's tincture is without equal in the protracted and persistent forms of ague.

Guice⁵ speaks highly of a method of treatment for malarial hematuria in which quinin does not have a part, and which he has used with entire success in 4 cases. This consists of the use of oil of turpentine to stop the hemorrhage, magnesium sulphate in half-ounce doses every four hours until six large evacuations are secured, liquid nourishment, and Fowler's solution to combat the malarial element.

INFLUENZA.

[Numerous contributions have followed the great pandemics of the last several years, showing the far-reaching influence of this disease, and its power to break down the vital forces and lead to tedious and disabling

¹ Deutsch. med. Woch., Aug. 23, 1894.

² Va. Med. Monthly, Feb., 1895.

³ Wiener med. Presse, xxxv., 1894.

⁴ Med. Press, July 4, 1894.

⁵ Amer. Medico-Surg. Bulletin, Sept. 1, 1894.

sequelæ.] Hulmann¹ in an exhaustive study of influenza concludes that direct transmission from person to person is the means by which this disease is spread. The contagion may also be carried by fomites. He instances a number of observations in which persons going from infected regions have established it in a previously uninfected community; and, on the other hand, instances in which early isolation prevented dissemination of the disease. Stewart² in the address on medicine before the British Medical Association dealt with the subject of influenza, laying special stress on its varied manifestations. Pfeiffer's bacillus he holds to be the cause, acting indirectly by its toxins. An attack of influenza seems to favor the development of other infections, especially tuberculosis, and it may lead to morbid processes due to faulty chemical processes, such as gout. Influenza is evidently contagious, and its period of incubation usually not over two days.

Kruse³ says that the diagnosis of influenza can be readily and surely established by examination of the sputum. The cover-glass preparations are stained with dilute carbol-fuchsin, and the bacilli are readily recognized.

Burgess⁴ reports 4 very interesting cases of serious pulmonary disease supposed to be dependent upon influenza. The first was one of spreading croupous pneumonia with subnormal temperature; the second, one of massive bronchopneumonia with similar depression of temperature; the third, one of gangrene; the fourth one of doubtful nature, having the features of a sacular pleurisy, not unlike some cases of interlobular pleurisy we have seen. There was discharge of pus from the bronchi and subsequent reaccumulation and discharge. [A number of other writers have spoken of gangrene of the lungs as a complication of influenza. These will be referred to in the section on Diseases of the Lungs.]

Glasgow⁵ records under the title of cellular edema of the lungs that condition of the lungs observed in influenza which is often spoken of as grippe-lung. The author's study is based upon 34 cases investigated clinically and postmortem. Some of these occurred before the first great epidemic of 1889, and are now included with the others from their manifest resemblance, despite the fact that their nature was not recognized at the time. The physical signs observed are those of irregular consolidation, the percussion being impaired, the respirations harsh and prolonged. Sibilant râles and occasionally subcrepitant râles are heard. When the edema is great enough to occlude the bronchi, there may be complete silence over the lung. Occasionally there may be signs of cavities.

[The powerful depressing influence of the grippal-poison upon the heart during and after the disease has been much spoken of, but from its importance deserves still more extended study.] Caw⁶ reports 6 striking cases illustrating the extreme cardiac failure liable to occur in influenza. This he regards as due either to disease of the nervous mechanism of the heart within

¹ Thèse de Paris, 1894.

³ Deutsch. med. Woch., 1894, No. 24.

⁵ Am. Jour. Med. Sci., April, 1895.

² Lancet, London, Aug. 4, 1894.

⁴ Dublin Jour. of Med. Sci., July 2, 1894.

⁶ Brit. Med. Jour., 1894, 1074.

the muscle itself or in the medulla, or to the great relaxation in the peripheral vessels, the result of depression of the sympathetic nervous system. The latter acts by depriving the heart of a sufficient supply of blood, and by causing diastolic arrest of the heart in consequence. The therapeutic indication is the administration of digitalis, but this should be done cautiously. Heffron¹ reports 5 cases illustrating some effects of influenza on the heart, showing that it may attack the myocardium, the endocardium, or the nervous mechanism. [The number of clinical contributions to the subject of the cardiac complications of influenza is considerable. There is still, however, little definite knowledge regarding the condition of the heart-muscle itself. The cardiac sequels are considered in the section on Diseases of the Heart.]

Gmeiner² analyzes a large series of cases of influenza that came under his observation in 1893 and 1894. It was notable that three times as many grown persons as children were affected, and three times as many men as women. No case occurred in a child under one year. Among the complications of note were long-continued dyspepsia, enlargement of the spleen pretty frequently, and acute nephritis in 1 per cent. of the cases. In 90 cases (22.3 per cent.) pneumonia set in. It differed from ordinary croupous pneumonia, particularly in the profuse sweating and in the gradual decline of the temperature. Meningitis developed in 10 of the 90, causing death in from five to eight days.

Turnbull³ refers to the aural complications liable to occur in the course of influenza. Among these are hemorrhage into the membrane, with subsequently perforation and discharge of serohemorrhagic fluid. Serious cerebral complications may follow. Lemecke,⁴ with other authorities, regards otitis hæmorrhagica as a very significant complication in influenza, sometimes of diagnostic significance. In 2 cases he found it associated with petechial hemorrhages in the skin and mucous membrane. More frequently, however, the otitis of influenza is simple or purulent, and therefore not distinctive. In some epidemics, however, notably in his experience during the winter of 1893-94, there is a tendency to caries and necrosis of the petrous bone.

Réthy⁵ refers to some of the less frequent pharyngeal and laryngeal complications of influenza. In 2 cases he found palsy of the posticus, right-sided in one and left-sided in the other. In another case perichondritis was observed; in another, abscess of the subcutaneous tissue. In 3 cases there were ulcers in the pharynx, varying in size from that of a millet-seed to that of a split pea, which were painful and somewhat indurated. They healed in about ten days. Finally, in 1 case, after fibrinous pharyngitis occurring in the course of influenza, erythema nodosum developed in the skin, while the throat-complication simultaneously improved.

¹ Med. News, June 8, 1895.

² Prag. med. Woch., Nos. 36-42, 1894.

³ Med. and Surg. Reporter, July 28, 1894.

⁴ Festschrift gewidmet Theodor Thierfelder, Leipzig, 1895.

⁵ Wien. klin. Woch., No. 48, 1894.

Gross¹ has contributed an interesting review of the literature relating to palsies after influenza. Such palsies he finds very common, not only following, but also during, the disease, and are due to central as well as peripheral functional and organic nervous disturbances, dependent upon the toxins as well as the hemorrhagic diathesis occurring in the disease.

Regarding the protective influence of quinin in influenza, Mossé² contributes some interesting experimental evidence. Animals were inoculated with the blood of individuals suffering with influenza. In 4 out of 7 experiments it was found that rabbits previously injected with quinin were protected in varying degrees. Three out of 4 rabbits previously treated with quinin escaped when inoculated with Pfeiffer's bacillus, while the control animals became ill, and 2 died. In 1 of these 2 latent tuberculosis was brought into activity by the inoculation. The author believes from these experiments and from clinical observation that quinin is both prophylactic and abortive. He advises the administration of 1 to 1.25 g. on the first two days, and 0.8 g. on the third day, after which gradually diminishing doses may be given.

CHOLERA.

Etiology.—[Most of the recent work upon cholera has been devoted to the determination of the relation of microorganisms to the disease. These contributions are properly considered in the section on Bacteriology, but so much of the subject as is of direct interest to the clinician in its relations with the questions of diagnosis may be properly considered here.] Rumpf³ concludes from an exhaustive study that Asiatic cholera must be attributed to the comma bacillus of Koch, which is indigenous on the delta of the Ganges. Infection is always carried by man, though locally distributed by water. Dirt, water, and heat favor the development of the organisms. As numerous observations have shown, the ingestion of the cholera-bacillus does not necessarily produce cholera. The occurrence or nature of the disease depends upon the individual's susceptibility and upon the virulence of the organism. Rumpf estimates that the number of cases in which severe cholera follows infection falls far short of 50 per cent. of the cases. The subsidence of an epidemic depends upon certain undiscovered causes leading to a decrease of the virulence or reproduction of the organisms.

Kemp contributes⁴ a most interesting and valuable compilation of recent work on the etiology and treatment of Asiatic cholera. It is of particular interest, from the diagnostic point of view, that the spirilla are so often missed or absent in the evacuations. This was noted by Hueppe, Lesage and Macaigne, Rumpel, Nanu, Kirchner, Rumpf, Renon, and in a number of instances the diagnosis of cholera nostras was made because of the absence of the spirilla, though the clinical history and the morbid lesions pointed to

¹ Inaug. Diss., Erlangen, 1894.

² Rev. de Méd., March, 1895.

³ Samml. klin. Vorträge, N. F., Nos. 109 and 110, Leipzig, 1894.

⁴ Brooklyn Med. Jour., July, 1894.

true cholera. In the majority of such cases the bacterium coli was found. Very often the spirilla found are atypical in their mode of growth. From his study of the whole question Kemp concludes that the failure to find the bacilli is mainly due to imperfection of our methods and to some extent to the seat of the organisms in the tissues. The point in regard to diagnosis still remains that the failure to find the spirillum does not exclude true cholera entirely.

[In the pathogenesis the most important fact brought out by recent studies is the relatively greater importance of toxins and less importance of anhydremia in the development of coma and collapse. This was evident in many cases in which these symptoms occurred in the absence of severe purging.]

Cassonte¹ points out that in the epidemic of cholera at Marseilles a distinct connection could be traced between cases of the disease and the infected water of certain wells. Persons using pure water escaped though exposed to the disease, while others under the same general conditions, but using the tainted water, succumbed. The closing of the suspected wells was followed by a subsidence of the disease. Surgeon-captain Crawford of Saran² describes an epidemic of cholera occurring under his notice in the jail of Saran. After nine years of immunity this jail suffered an epidemic in 1889 and every year thereafter. That of 1892 was more severe, however, than the others. There were in all 30 cases, of which 15 died. The disease seemed traceable to the river-water used. After the epidemic had reached considerable proportions the majority of the prisoners was removed to one of the camps required of every prison by the regulations, and the epidemic soon subsided. The medical treatment used was that with nitrite of amyl, but no special benefit could be ascribed to it.

The possibility of transmission of cholera by house-flies is shown by the experiments of Craig,³ who allowed flies to feed upon bread saturated with a bouillon-culture and obtained cultures from the intestinal contents. The flies were unaffected.

Jewett⁴ reports an epidemic of cholera at Sivas, Turkey, a town having the unusual elevation, for the occurrence of cholera, of 5000 feet above the sea-level. The hygienic conditions were frightfully bad, and yet the mortality was but 30 per cent. There was clear evidence that the disease is not contagious.

The positive proof of the specific character of the cholera bacillus has come in the case of Dr. Oergel of the Hygienic Institute at Hamburg, who died from cholera acquired by direct infection. The details of the case are reported by Reincke.⁵ It is not definitely known how the infection occurred, though it was known that Oergel had met with accidents in handling cultures several times, and once inadvertently sucked up through a pipette

¹ Thèse de Paris, G. Steinheil, 1894.

² Edinb. Med. Jour., Nov., 1894.

³ Med. Rec., July 24, 1894.

⁴ Boston Med. and Surg. Jour., Nov. 1, 1894.

⁵ Deutsch. med. Woch., No. 41, 1894.

some of the peritoneal contents of a guinea-pig inoculated with virulent cultures. Soon after this diarrhea set in, and was followed in two or three days by cramps and collapse. Cholera bacilli were abundant in the stools, and after death the diagnosis was confirmed by autopsy.

G. Klemperer¹ records most interesting studies of the question of infection and immunity in Asiatic cholera. He points out that intravenous injection of the cultures causes characteristic purging and vomiting in dogs, guinea-pigs, rabbits, and goats, as do also injections of cultures that have been heated, and cultures of the bacterium coli. This action of cholera bacilli he attributes to the cholera-protein. When the cultures are introduced into the intestinal tract symptoms are frequently entirely wanting, and dogs in particular show a resistance to the absorption of the cholera-protein as well as the cholera-toxin. But other animals absorb the toxin to some degree. The failure of action of the cholera-toxin he claims to be due to the existence of a nuclein of acid character in the epithelium and other cells of the mucous membrane. This was demonstrated by the absorption of the basic stains by these cells from Ehrlich's three-color mixture. The same failure of action of cholera bacilli in the intestines of man has frequently been noted, and it is probably to be explained in a similar manner. Metschnikoff² in an investigation on the subject of immunity from cholera concludes that this is due to the deteriorating influence of associated micro-organisms, such as the bacillus pyocyaneus. On the other hand, cases of intense susceptibility are due to the stimulating influence of the other micro-organisms, such, *e. g.*, as the torula. Rumpel³ reports the study of 151 cases occurring during the epidemic of cholera at Hamburg during the winter of 1892-93. Of these, 9 were instances of infection with the vibrio without symptoms, 25 were cases of cholera-diarrhea in which the principal symptom was diarrhea; 35 were cases of cholera—by which are designated instances in which both purging and vomiting occurred—and 82 were cases of pronounced cholera.

Treatment.—In regard to treatment Kemp⁴ concludes that the value of dilute acids as prophylactics are of undoubted value; that opium is not advisable after the first stage of preliminary diarrhea; that calomel is the most useful remedy for its intestinal action, but that the ordinary intestinal antiseptics are wholly unreliable. The value of Cantani's treatment by intestinal injections has not yet been definitely settled, because no one as yet has carried it out with sufficient thoroughness.

Rosner⁵ has treated 7 cases of cholera with intravenous injection of sodium-chlorid solution, and of these 4 died and 3 recovered. He found that the pulse improved at once and the temperature became elevated. In a short time diarrhea grew less, and occasionally the vomiting also was favorably influenced.

¹ Zeitsch. für klin. Med., vol. xxv. H. 5 and 6.

² Wiener med. Presse, xxxv., No. 39.

³ Berl. klin. Woch., Aug. 6, 1894, et seq.

⁴ Loc. cit.

⁵ Wien. med. Woch., Feb. 23, 1895.

Fullerton¹ claims that the most useful and scientific treatment of Asiatic cholera is that with quinin. No remedy in quantities capable of destroying the spirilla can be given by the mouth without killing the individual, and he therefore seeks an inhibitant. This he claims is found in quinin. From 20 to 40 gr. suffice to inhibit the growth of the microorganisms in any quantity of liquid likely to be present in the alimentary tract. The mucosa is so unabsorptive that cinchonism can scarcely result. He quotes statistics to show that this treatment, properly carried out, reduces the mortality even of severe cases to 25 per cent. [The reports showing the inefficiency of quinin all bear evidence that the remedy was improperly administered.]

Freytmuth² reports 3 cases of cholera treated by injection of serum of patients convalescing from the disease. Two recovered, while the case of the patient that died was an instance of mixed infection. The serum was used in doses of 10, 20, and even 50 cc.

Haffkine³ has reported to the Medical Congress of India the results of his method of inoculation for cholera. Of 1735 persons not inoculated in a certain section, 174 took the disease and 113 died, whereas of 500 inoculated, but 21 were affected, of whom 19 died. He is willing to admit that the number of observations should be larger before definite conclusions are drawn, but the evidence is thus far in favor of the method, and there is certainly nothing to urge against it on the ground of danger.

Blagowjeschtschenski⁴ in a series of 300 cases of cholera observed 4 in which there was a coincidence of erysipelas, the latter being diagnosed by bacteriologic methods. In each of these the patient was in the algid stage of cholera when the erysipelas developed on the third or fourth day of the case, and in each with the development of the complicating disease the temperature rose, dejections and cramps ceased almost suddenly, and the general condition of the patient improved markedly within twenty-four hours. The author regards the improvement in these cases as an evidence of antagonistic action of the toxins of the two diseases concerned.

DYSENTERY.

Chaltin⁵ in an investigation of dysentery found amebæ absent in all of 325 cases examined, and concludes that these organisms are of no particular significance in this climate. As a rule, the dejections contained the bacterium *coli commune* and *proteus vulgaris*. Vivaldi,⁶ on the other hand, as a result of investigations regarding the causation of dysentery, believes that the amebæ have a specific action in preparing the ground for the action of other microorganisms. He would, therefore, speak of a form of symbiosis. He claims to be able to cultivate the ameba in sterilized hay-infusions in Petry's dishes. Roos⁷ details interesting experimental studies of the pathogenicity

¹ N. Y. Med. Jour., Aug. 18, 1894.

³ Münch. med. Woch., Jan. 29, 1895.

⁵ Ibid., Aug. 11, 1894.

² Deutsch. med. Woch., Oct. 25, 1894.

⁴ Centralbl. f. Innere Med., Feb. 9, 1895.

⁶ Riforma Med., 1894, No. 138

⁷ Archiv für exper. Path. und Pharmacol., xxxiii. H. 6.

of the ameba coli of Loesch. Taking the dejecta of a case of dysentery of Sicily, he was able to produce violent diphtheric colitis terminating in a fatal issue in from ten to twenty-one days by injection into the rectum of cats. When the encysted form was fed by the mouth, the same result was obtained, but the younger forms did not act in the same way. The amebæ from a case contracted in Germany did not prove so virulent, and the ameba vulgaris produced no result at all.

R. P. Jones¹ reports a case of dysentery of diphtheric type in which there was steady deterioration under the use of opium and almost instant improvement and eventual recovery under the use of ipecac.

TUBERCULOSIS.

Etiology.—But few new facts have been added to the existing knowledge regarding the causation of tuberculosis and the modes of infection. Sherman and Lamkin² relate the case of a boy of four years in whom the symptoms of tuberculous meningitis developed and led on to a fatal termination. The child had had two attacks of pneumonia from which it recovered entirely. The 3 cows from the mixed milk of which the child was fed were injected with tuberculin, and a positive reaction obtained in 2. These were destroyed, and tuberculosis found to exist in them. [It is not at all improbable that this may indicate the source of the infection.] The entire subject of milk-infection was taken up by the Massachusetts Society for Promotion of Agriculture, and the studies presented by Prof. Ernst.³ He found that tubercle bacilli sometimes occur in the milk of cows having no demonstrable tuberculous lesion of the udder. This was determined by cover-glass preparations, as well as by inoculations of animals. Further, it was found that the feeding of infected milk to animals caused the disease in a certain proportion of the cases.

A case of congenital tuberculosis is reported by Lehmann.⁴ The tuberculous mother died three days after the birth of her child of tuberculous meningitis; the child lived but twenty-four hours. In its spleen, lungs, and liver were found nodules resembling tubercles, and containing tubercle bacilli in large numbers. The placenta was not examined. [This seems an undoubted instance of intrauterine infection.]

Collings and Murray⁵ record 3 cases of tattooing which apparently had led to tuberculosis. A boy of fifteen a short time before his death from tuberculosis tattooed his two brothers and a young friend. There was no evidence that the saliva of the patient was used, although he says he may have done so. About three weeks after the operation pustules and inflamed elevations appeared about the point of inoculation, the glands near by enlarged, but the general health did not suffer much. Mr. Jonathan Hutchinson agreed with the authors in regarding the lesions as probably tuberculous.

¹ Dublin Jour. Med. Sciences, Aug. 1, 1894.

² Med. Record, No. 1247, p. 412.

³ Infectiousness of Milk, Boston, 1895.

⁴ Berlin. klin. Woch., July 9, 1895.

⁵ British Med. Jour., June 1, 1895.

Giant-cells were found in the portions of the skin examined, but the presence of tubercle bacilli was not demonstrated.

Ulsner¹ contributes a very suggestive resume and study of the subject of mixed infection in pulmonary tuberculosis, in which he reaches the following conclusions: 1. Tubercle bacilli alone can cause changes in the lung with the symptoms of acute pneumonia in the course of latent or chronic phthisis; 2. The course of pulmonary tuberculosis is greatly varied by the occurrence of secondary or concurrent infection; 3. Acute pneumonia may occur in a tuberculous as well as in a previously healthy lung, and in the cases of latent tuberculosis the latter is likely to be lighted into activity; 4. Streptococci and other bacteria are liable to be aspirated from cavities and cause rapidly-progressing pneumonic changes with profuse hemoptysis; 5. Secondary or mixed infection is the important consideration in the development of lowered vitality and septic or pyemic complications in pulmonary tuberculosis. Spengler² found among 50 cases of pulmonary tuberculosis but 5 of uncomplicated infection with tubercle bacilli, the rest exhibiting some form of added infection, the most common being that with streptococci. In the latter there were noted the active forms in which there is fever, and the passive in which there is no fever. Climatic treatment was often efficient only to the extent of removing the added infection without influencing the original tuberculosis. In uncomplicated cases he holds to the value of injection of tuberculin. In the mixed cases climatic treatment should be first instituted to remove the secondary infection. [The effects of nationality on the susceptibility to tuberculosis can be best studied in America, where many nationalities and races are represented. The unfavorable influence on negroes has been repeatedly noted, and differences undoubtedly exist as respects the individual nationalities of European origin.] Thus Sears³ found that in 200 cases nearly 50 per cent. belonged to the first and second generation of Irish immigrants.

Tuberculosis of the Lungs.—[The occurrence of this affection in association with intrathoracic aneurysm has been frequently noted, and is certainly not uncommon, making allowance for the cases of necrosis of the lung consequent upon aneurysm which have been improperly regarded as pulmonary tuberculosis. There seems also a certain relation of other intrathoracic growths to the liability to tuberculosis.] Fehde⁴ reports 3 very interesting cases in which pulmonary tuberculosis was found associated with intrathoracic tumor. The first was a case of an old man who presented the signs and symptoms of a tuberculous consolidation of the left apex. The degree of weakness and emaciation and the absence of fever were, however, rather atypical. There was a small tumor in the region of the parotid where a mole had been removed years before. The latter grew and finally ulcerated,

¹ Buffalo Med. and Surg. Jour., Nov., 1894.

² Zeitsch. für Hyg. und Infektionskrankh., No. 18, 1894.

³ Boston Med. and Surg. Jour., April 4, 1895.

⁴ "Lungentuberculose mit Brusthöhlengeschwulste," Inaug. Diss., Leipzig, 1894.

and another tumor developed in the skin of the chest. The patient died after six months, and at autopsy the lungs were found to contain secondary nodules of carcinoma in addition to tubercles and dilated bronchi. Other secondary carcinomatous nodes were found in the kidneys. The second case occurred in the person of a man thirty-eight years old. He first noticed blood in the urine, then there was marked abdominal pain and great emaciation. Later, cough, difficulty in swallowing, and vomiting were noted. Finally, there was a large abdominal tumor. At autopsy there was found a large tumor of the suprarenal and kidney of the left side, which the author regards as of the class described by Grawitz as *struma lipomatodes suprarenalis aberrans*. There were numerous nodules in the pleuræ of both sides, and besides considerable involvement of the right lung by tubercle. In the third case the illness of the patient, a man of thirty-four years, began rather abruptly like an acute pleurisy. The lesion in this case was an aneurysm of the transverse part of the arch of the aorta about the size of a billiard-ball, with considerable infiltration of the lungs, especially the left, with tubercles. There was some pleurisy. Percy Kidd¹ says regarding intercurrent croupous pneumonia in the course of pulmonary tuberculosis that during his service as pathologist to Brompton Hospital he had never seen an instance in 700 autopsies, and during thirteen years' connection with that hospital had never known a patient to contract acute pneumonia. In 500 autopsies at the London Hospital conducted by himself he had met 1 case of croupous pneumonia associated with circumscribed chronic tuberculous disease in each lung without any excavation. In several persons dying of acute pneumonia, arrested and limited tuberculosis was found in the lungs, but in only the 1 case cited was the disease progressive. He therefore thinks acute pneumonia a most exceptional event in pulmonary tuberculosis. [This is certainly not our own experience nor that of others. Reference has already been made to certain reports on mixed infection (see Etiology).]

Huchard² believes that tuberculosis is a predisposing factor to herpes zoster. It may lead to herpes directly by implication of the intercostal nerves adjoining the diseased pleura, but, as a rule, there is some added determining cause, as intoxication by lead, alcohol, or uremia, or some infection, as in one of his own cases in which the immediate cause was influenza.

Diagnosis.—Destrée of Brussels³ states that unequal dilatation of the pupil is frequent in tuberculosis of the lungs, and may occur long before the lesions of the lung are advanced. It is due to irritation of the sympathetic nerve at the hilum of the lung, and is generally found on the side affected. In 1 case he saw mydriasis five years before the pulmonary lesion developed. [The likelihood of accidental inequality of the pupils must, however, not be lost sight of.]

[Slight impairment of resonance and weakness of the breath-sounds at

¹ The Practitioner, Sept., 1894.

² Union méd., No. 42, 1894.

³ Canada Pract., Sept., 1894.

the right apex have frequently been pointed out as occurring in normal individuals. Ignorance of this might easily lead to a diagnosis of incipient pulmonary tuberculosis in persons with healthy lungs.] Moncorge¹ found in 20 persons in full health a remarkable weakness of the breath-sounds on the right side, but in all these cases this weakness disappeared after a period of gymnastic exercise and douching. In all of them it was found on inquiry that they slept invariably on the right side, and the author concludes that the weakness of the sounds is due to the continued inactivity during sleep.

Rendu² ventures the diagnosis of pulmonary syphilis in a case of a woman of sixty years who complained of pains in the limbs, dyspnea, and cough without expectoration. There was no fever. The cough had existed for twenty years. There were lesions in the skin, eyes, and nose, and nocturnal headaches that justified the positive diagnosis of syphilis. There was also a mitral regurgitant murmur, but no signs of failure of compensation. There was dulness at the apex of one lung, with slight bronchial breathing, but no rales. On the strength of the long duration, the absence of rales and expectorations, and the decided signs of syphilis he felt the diagnosis of pulmonary syphilis might be made, though the usual localization of the latter is in the lower lobe.

Tuberculosis of the Mouth.—Jarunowski³ records a case of pulmonary tuberculosis in which there was discovered an ulcerous lesion of the mouth in close association with a carious tooth. The contents of the latter on examination was found to contain almost a pure culture of tubercle bacilli, and seemed undoubtedly to have been the source of infection leading to the lesion in the mouth. The author quotes in connection with his case the investigations of Miller, which show that the cavities of carious teeth offer a favorable soil for the multiplication of microorganisms of various sorts. Walter⁴ details a similar case of tuberculosis of the lungs in which secondary infection of the mouth ensued. When the patient came under observation there was a destructive ulceration of the alveolar process of the hard palate on the left side, between the first bicuspid and last molar teeth, which exposed the roots of the teeth and perforated into the antrum. The infection was traceable to the pulling of teeth in the lower and upper jaw, but the upper jaw alone was affected, the author thinks, because in the process of expectoration the infective particles would be pressed upward by the tongue, whereas the lower jaw would escape. A similar case was recorded by Rethi in 1893.

Tuberculosis of the Tonsils, Pharynx, and Larynx.—Dieulafoy⁵ calls attention to a latent variety of pharyngeal tuberculosis, the favorite seat of which is the adenoid tissue of the nasopharynx and tonsils. It manifests itself by a hypertrophy of the palatine or pharyngeal tonsil. He bases the view of the tubercular nature of some of these cases upon the inoculation of guinea-pigs. In all the cases of which the materials were injected into ani-

¹ *Lyon méd.*, 1894, Nos. 16 and 17.

² *Bull. méd.*, May 20, 1894.

³ *Münch. med. Woch.*, April 30, 1895.

⁴ *Thérapeut. Monatshefte*, Feb., 1895.

⁵ *Centralbl. f. Innere Med.*, 1895.

mals the pharyngeal tuberculosis was primary. It is supposed that young persons with enlarged tonsils provide a favorable soil for the growth of the bacillus, which finds its access with the food, especially milk, or with the inspired air. In some instances the bacilli may be present for months or years, and become destroyed by phagocytosis and induration of the tonsil; in other cases, however, the bacillus may find its way into the lymphatic vessels, and the neighboring glands may become tuberculous. The process may become latent at this stage, but there is a liability to further spread through the lymphatics, thoracic duct, and right heart to the lungs. Chauveau in discussion stated that animals fed on tuberculous matter may become infected in the adenoid tissue of the base of the tongue and in the pharynx. Krückmann¹ confirms Hanau and other observers in the view that the tonsils are the portal of entrance for tubercle bacilli in cases of tuberculosis of the cervical lymphatic glands. In 64 autopsies 25 showed tuberculous disease and 12 tuberculosis of the tonsils, which in nearly all cases was combined with disease of the cervical glands. Tusseau² records 3 cases of tuberculosis of the tonsils. He believes that chronic inflammations of the tonsils predispose to tuberculous infection, and in particular thinks that alcohol and tobacco are responsible for the development of this predisposition in many cases.

Catti³ would add a pharyngolaryngeal type to the existing forms of acute miliary tuberculosis, and records 2 cases conforming to this type. Both occurred in young children, in whom dyspnea, difficulty in swallowing, hyperplasia of the glands of the neck and thorax, and marked increase of the heart's action were the only symptoms. The uvula, soft palate, epiglottis, and aryepiglottic folds were red, swollen, and edematous, and presented ecchymoses as well as numerous gray and yellow tubercles.

Tuberculosis of the Nasal Chambers.—Dmochowski⁴ shows that tuberculosis of the nasal chambers is a very common complication of general tuberculosis. Among 64 cases the nose was involved in 21, and of the 9 instances of general miliary tuberculosis there were nasal lesions in 6. In most cases there is no doubt that the involvement of the nose is secondary, but the author regards primary nasal tuberculosis as at least a possibility.

Tuberculosis of the Stomach.—Orlandi⁵ records a case of primary tuberculosis of the stomach in a man of twenty. There was an ulcer near the pylorus extending down to the serous coat; the thickened edges of this caused some narrowing of the pylorus. Its tuberculous nature was proved by the giant-cells and other histologic characters, and by inoculation of animals. Another area of tuberculous infiltration occurred in the small intestine, but none elsewhere. The clinical manifestations in this case suggested tapeworm and vague gastric disease.

¹ Virchow's Archiv, Bd. cxxxviii. Heft 3.

² Lyon médicale, No. 16, 1894.

³ Wien. klin. Woch., June 14, 1894.

⁴ Ziegler's Beiträg. zur Path. Anat. und zur allg. Path., xvi. Heft 1.

⁵ Wien. med. Woch., No. 10, 1894.

Tuberculosis of the Kidneys.—Pousson¹ records a case of primary renal tuberculosis, the interesting point regarding which was the long continuance of profuse hematuria without any other alteration of the urine.

Treatment of Tuberculosis.—De Renzi² maintains that exercise increases digestion and prevents extension of tuberculosis. He therefore insists upon moderate exercise even in advanced cases, recommending gymnastic exercises, fencing, riding, but, above all, swimming. Pulmonary exercises are also useful. [Much as this contribution bears evidence of careful study, it must be remarked that more must be dependent upon the individual nature of each case than upon theoretical deduction from a general study.]

Reed³ insists that many cases of tuberculosis are overfed, and presents clinical histories to show that restriction of the diet in accordance with the oxygenating capacity of the patient leads to great improvement in all the symptoms.

Prof. Jaccoud⁴ points out that the beneficial effects of high altitudes in pulmonary tuberculosis are mainly due to the altitude itself. The results of this are increased number of the red corpuscles and increase of hemoglobin, and greater oxygen-carrying power of the blood, unconscious increase of pulmonary expansion, with better cardiopulmonary circulation, and greater freedom of evaporation from the lungs. [High altitudes are not useful when the patient is of an extreme nervous temperament, when there is disease of the heart, a tendency to hemorrhage, or when there is emphysema or pneumonic phthisis.] Munn⁵ recites the advantages of Colorado as a climate for tuberculous patients. The dryness is seen from the facts that the annual deposit of moisture in Denver during twenty years has been but 14.5 in., and that the average humidity has been but 43.7 to 51 per cent. during the last three years. The advantages in the way of sunshine are evident from the observation made during the year 1892 that there was sunshine in 62 per cent. of the possible hours during which it could occur. He declaims against the common belief that patients who have been benefited may return to their former home, claiming that in practically all cases the change of residence must be regarded as permanent. It is to be remembered also that a period of several years is necessary before a cure can be expected. Bowditch⁶ contributes an interesting paper on the results of the treatment of incipient pulmonary tuberculosis in the sanatorium at Sharon near Boston. In three years there have been treated in this institution, with careful attention to every hygienic detail, 51 cases, of which 3 did not stay long enough to receive any benefit. Of the other 48, 8 proved to be cases of bronchitis and were discharged well. Of the remaining 40, 11 were not improved, 6 were improved, 13 much improved, and 10 were "arrested." In the last named,

¹ Jour. de Méd. de Bordeaux, No. 9, 1895.

² Wien. med. Blätter, No. 24, 1894.

³ Med. News, Sept. 22, 1894.

⁴ Am. Pract., May, 1894.

⁵ Med. News, Aug. 18, 1894.

⁶ Boston Med. and Surg. Jour., July 12, 1894.

bacilli were found in the sputum in but 3, though the associated symptoms warranted, in the author's opinion, the diagnosis of incipient tuberculosis.

Reid,¹ as a result of theoretic considerations, treated a case of acute pulmonary tuberculosis by continuous and persistent reduction of body-temperature, aiming thus to lower the vitality and consequent virulence of the tubercle-bacillus. Antifebrin was given as often as the temperature rose to 101° F., and spongiopilin soaked in spirit lotion applied to the chest. A further bacillicidal element of the treatment was the almost continuous dry inhalation of creasote-vapor. Internal treatment consisted of tonic and stimulating remedies, and at the end of eight weeks there was an apparent cure.

Gibotteau² in a study of 18 cases of pulmonary tuberculosis combined with hysteria points out that the latter disease exercises an ameliorating effect upon the former, rendering its course less acute and the disease in general less marked. On the strength of these studies he advises against active treatment of hysteria in tuberculous persons.

Regarding the drug treatment, Coley³ finds that the carbonate of guaiacol improves the appetite and general health and weight of the patients, without apparently affecting cough, expectoration, or the physical signs. He administers 15 gr. every night as the initial dose for an adult. After a few days it may be given two or three times daily, gradually increasing the dose; he himself has never given above 50 gr. daily. Conway⁴ believes that creasote, when used in large doses, is a specific in tuberculosis. Stress is laid on the mode of administration, which should be by capsules containing 1 part of creasote to 2 of cod-liver oil, the dose of creasote being increased by 2 minims every fourth day until a dose of 20 minims is given.

Petteruti⁵ details at length 2 cases of tuberculosis of the lungs completely cured, and 1 decidedly improved, under the influence of the cantharidinate of potassium.

Carasso⁶ claims to have had excellent results in the treatment of pulmonary tuberculosis by inhalation of oil of peppermint. The cushion of an inhaler is moistened several times daily with 5 or 6 drops of the oil, and the patient takes deep inspirations, holding the breath for a time after each breath. The inhaler is worn night as well as day. At the same time creasote in combination with alcohol, glycerol, chloroform, and spirit of peppermint is given by the mouth, and the diet and general regimen are strictly regulated. [The author makes very extravagant claims for this treatment.] Rochester⁷ treated 34 cases of pulmonary tuberculosis by Carasso's method of peppermint-inhalations and the internal administration of creasote with forced feeding. The results led him to conclude that the internal treatment is unphysiologic, and is very likely to cause disturbance of digestion, and

¹ Australian Med. Jour., Feb. 20, 1895.

² Thèse de Paris, Steinheil, 1894.

³ The Practitioner, Oct., 1894.

⁴ N. Y. Med. Jour., June 1, 1895.

⁵ Therap. Monat., Feb., 1895.

⁶ Wiener med. Presse, 1894, xxxv. p. 1466.

⁷ Jour. Am. Med. Assoc., June 1, 1895.

that the inhalation of peppermint is valuable and deserves further investigation. Baldwin,¹ led by Carasso's report of his method of peppermint-inhalations in pulmonary tuberculosis, investigated its value in experimental tuberculosis, and found that, although the oil of peppermint may prevent the bacillus tuberculosis from growing in a test-tube, yet its local antiseptic action in the respiratory tract is so slight as not to impede the growth of any bacteria.

Mund² reports very favorable results from the method of treatment instituted by Loebinger in pulmonary tuberculosis. This consists in the inhalation of some insoluble powder holding 10 per cent. of an ethereal oil (oil of peppermint, for example). The patient leans over toward the healthy side and takes short, quick inspirations, holding the tongue forward. In this way the seat of disease is readily reached, and the oil there evaporates by the heat of the body.

Cadier and Jolly³ record additional cases in support of their method of treating tuberculosis by injection of iodine with phosphates, and find that during the first month there is an appreciable improvement in the local condition, and the general condition of the patient greatly improves. After four or five months of treatment the local lesion more rapidly improves, while in the period of from ten months to two and a half years they note a progressive amelioration simultaneously in the general and local symptoms, rales disappearing, and the patient being enabled to resume his customary occupation, even despite the rigors of winter.

Foxwell⁴ reports very favorable results from the use of iodoform, even in advanced stages. Of 46 cases in which he preserved accurate notes, 12 were much improved, 15 improved, 11 remained stationary, and 8 died. He advises beginning with 2 gr. in pill thrice daily at first. If this is well borne, the dose is increased until 30 gr. daily are given, and thus continued for three months, after which smaller doses are given for another three months.

Paquin⁵ claims to have produced an antitoxic serum of tuberculosis by successive inoculation of horses, and reports a number of instances in which it is claimed there was rapid improvement in cases of beginning as well as of quite advanced pulmonary tuberculosis. Cases should be excluded which are seriously complicated bacteriologically or pathologically. The author reports 22 cases treated by himself and associates at the St. Louis City Hospital, and 3 cases treated by Dr. George Cale. The injections were begun in doses of 10 drops and gradually increased to as much as 150 drops every day. No accidents whatever were noted, the serum apparently being harmless except for the production of a slight rash occasionally. [He does not consider, nor apparently appreciate, the importance of mixed infection and associated septicemia in pulmonary tuberculosis.]

¹ N. Y. Med. Jour., May 18, 1895.

² Ibid., Oct. 20, 1894.

³ Jour. de Méd. de Paris, June 17, 1894.

⁴ Birmingham Med. Rev., July, 1894.

⁵ Jour. Am. Med. Assoc., March 9, 1895.

Emmerich¹ has made some elaborate investigations on the value of erysipelas-serum in various diseases. In animals it was possible to demonstrate the restraining influence it had on tubercular lesions of the eye, and his experiments led him to expect a similar effect in tuberculosis of man. The serum of inoculated sheep was used.

Waldstein² in a study of the leukocytes in infectious diseases was struck by the great increase in number of the polynuclear elements and the lessening of the lymphocytes during the height of these diseases, and the exact reversal of these conditions during restoration. This observation suggested that some remedy might be found that would produce similar conditions, and that might therefore influence favorably the course of certain infectious diseases. Potassium iodid was found to have such action, but its hypodermic injection is likely to cause local troubles. Pilocarpin, on the other hand, may be used with safety and has a constant tendency to produce the conditions named. In rabbits it was possible to alter the relations of the lymphocytes and polynuclear elements, making the proportions as 4000 to 900, respectively. The treatment would seem to be of special value in cases of tuberculosis, and in a limited number of observations the author feels justified in asserting that there was a tendency to cure. This was visible in the walls of a cavity in one case that came to autopsy, and still more strikingly in the visible lesions of a case of lupus.

Vaughan³ contributes a further article on the treatment of tuberculosis with yeast-nuclein, from which he concludes that when cavity-formation has taken place nucleinic acid is of no avail, but when secondary infection with pyogenic germs has not occurred, even though the tuberculosis is of long standing and the extent of tissue involved is great, the proper use of the remedy may retard the progress of the disease. He believes a temporary cure may be effected where the area involved is small and the resistance of the patient is not too much reduced. He claims a temporary cure for these cases, none under his observation having been followed a sufficiently long time to assert permanent results. The results in a few cases of urinary tuberculosis under his care have been remarkably satisfactory. Finally, he points out that nucleinic acid improperly used may do harm, and should not be indiscriminately employed. Garber⁴ believes that nuclein possesses the power of stimulating the production of white blood-corpuscles, and reports 12 cases, the majority being pulmonary tuberculosis, which seemed to warrant the belief that it is an agent valuable in beginning tuberculosis, but of no value in advanced cases.

[Guaiacol applied externally has been reported as an excellent remedy to reduce fever in pulmonary tuberculosis, typhoid fever, and other diseases; but a number of observers have found that there is a tendency to excessive decline of temperature and the occurrence of collapse. We ourselves have

¹ Münch. med. Woch., 1894, Nos. 29, 30, 31.

² Berlin. klin. Woch., April 29, 1895.

³ Med. News, Dec. 15, 1894.

⁴ Therapeutic Gazette, Jan., 1895.

noted this in several cases.] De Renzi¹ and Olivieri² both confirm previous observations that guaiacol externally applied reduces fever promptly, but that it is a remedy not to be advised in the fever of pulmonary tuberculosis or any other disease. The other symptoms of the diseases in which they made trial of the remedy were regularly made worse. J. Solis-Cohen,³ however, from a limited experience, thinks the use of guaiacol in tuberculosis a valuable method of treatment to promote the comfort of the patient. The most satisfactory dose was usually 25 drops. Bartoszewics⁴ has made a rather extended study of the use of guaiacol as an antipyretic. He applies the drug in doses of from 20 to 30 drops on a cloth simply held in place. Friction is likely to set up dermatitis. Among 65 cases failure was noted in but 5, while the former degree of fever was attained in only 9. He denies that there is danger of collapse even in pulmonary tuberculosis, but in this disease there is almost invariably rigor and sweating some time after the treatment.

Conkling⁵ finds that in night-sweats the most generally useful remedy is agaricin in pill form, gr. $\frac{1}{12}$ at bedtime, or one pill late in the afternoon, and a second four or five hours later. Zinc oxid in pill form, gr. iiss, was also very efficient, as was chlorolamid, gr. xxx, when there were sleeplessness and excessive cough in addition to sweating. Atropin is not to be used indiscriminately, on account of associated actions on the other secretions and the circulation. Other remedies were of little use.

PYEMIA AND SEPTICEMIA.

Manchot⁶ records an interesting case of cryptogenetic sepsis occurring in a case of diabetes. The patient, a man of forty-three years, was suddenly seized with pain in the back of the neck, followed by delirium and gradually increasing fever. His appearance suggested typhoid fever, and no local cause for the pain and stiffness of the neck could be discovered. After death the organs, and especially the enlarged spleen, showed evidences of the septic state of the patient, and bacteriologic examination revealed the staphylococcus pyogenes flavus. A phlegmonous inflammation of the submucosa of the pharynx was also detected, and was doubtless the starting-point of the infection. Clark⁷ records a case of marked pyemia in which the source of infection was not detected until the autopsy disclosed purulent thrombosis of the right internal jugular vein and of the transverse sinus within the skull. There was also septic infection in the middle ear and mastoid cells.

Bose⁸ records 2 cases of fever attended with polymorphous erythema in young adults in which a bacillus resembling the bacillus coli seemed an etiologic factor. The fever was irregular, and its exacerbations were accompanied by aggravations of the skin-eruption. After a prodromal period in

¹ Rivista klin. e Terap., Nov., 1894.

² Med. News, Nov. 24, 1894.

³ Brooklyn Med. Jour., July, 1894.

⁴ Med. News, Jan. 5, 1895.

⁵ Gaz. degli Ospedali e delle Klin., No. 149, 1894.

⁶ Therap. Gaz., March 15, 1895.

⁷ Jahrb. der Hamburg. Staatskrankenanstalten, Bd. iii.

⁸ Revue de Méd., Aug., 1894.

which digestive disturbance was the principal symptom the disease rapidly developed, with rigors, vomiting, prostration, and the appearance of the eruption. One of the cases was fatal, developing coma and subnormal temperature before death. The duration was long and the course irregular. The rash was at first a papular erythema, and later it resembled that of measles, scarlet fever, and finally erysipelas. Desquamation followed each outbreak of eruption, and the hair fell out. Beyond prostration there were no nervous symptoms until the end in the fatal case. In the latter the onset of the symptoms was preceded by the formation and discharge in the rectum of a prostatic abscess. In the other case obstinate constipation preceded. The author regards these cases as due to the absorption of chemical poisons of the bacillus in question. The bacillus itself was not found in the blood.

LESS COMMON AND OBSCURE INFECTIONS AND INTOXICATIONS.

A suggestive report of a local milk-infection is reported by Niven.¹ The patients numbered 160 and belonged to 417 different families. All became ill about the same time with nausea, abdominal pains, and diarrhea. The disease was traced to uncooked milk, which was derived from the same source in all cases. Bacteriologic examination of the milk, which was allowed to stand for several days, disclosed the bacterium coli commune and streptococci. The source of infection was supposed to be a disease of the udder of one of the cows. The author refers to similar cases investigated by Gaffky.

Tappeiner² has made a study of the cases of poisoning by mushrooms that occurred in Munich during August and September of 1894. There were 18 cases in all, of which 5 died. In the first group of 5 the symptoms began from five to twelve hours after the ingestion. There were 2 forms among these—the one in which gastrointestinal symptoms were marked, the nervous symptoms mild, and the outcome favorable; the other, in which nervous symptoms were pronounced, the gastrointestinal symptoms absent, and a fatal issue more likely to occur. There were no evidences of blood-destruction during life, but postmortem the liver presented a deep yellow appearance, and in common with the heart and kidneys showed advanced fatty degeneration. In a later group of cases gastrointestinal symptoms were followed by a comatose condition, with marked slowing of the pulse and anuria. The author regards the cases as instances of poisoning by the amanita phalloides, although no portions were obtainable for examination.

In discussing the question of the coexistence of infectious diseases in the same person Caiger states³ that in the last four years he has seen 362 cases in which 2, and 17 in which 3, infectious diseases ran some parts of their course coincidently.

DENGUE.

De Brun⁴ contributes an interesting study of the eruptive forms of dengue as seen in the epidemic at Beirut during the latter months of 1892.

¹ Lancet, Jan. 18, 1895.

² Münch. med. Woch., Feb. 12, 1895.

³ Med Record, Aug. 25, 1894.

⁴ Rev. de Méd., No. 6, 1894.

The eruption was roseolous, morbilliform, scarlatinous, or papillary, but never vesicular or pustulated. Three groups of cases were distinguished: those attended with marked fever and general symptoms and eruption; those in which the fever was absent, the symptoms mild, and the eruption present; and those in which the eruption was the only symptom. The nature of the latter was recognized by the existence of the epidemic and the resemblance of the rash to that seen in other cases. The eruption appeared from the first to the second day, but often later, and lasted from thirty-six hours to a week, after which there was desquamation of varying intensity, attended with itching. The eruption appeared in from 25 to 50 per cent. of the cases.

[The following undetermined and apparently infectious form of disease bears certain resemblances to dengue, and may be included under that head.] Müller of Marburg¹ contributes a most interesting study of the epidemic variously called *Schlammfieber*, *Schlammkrankheit*, *Sumpffieber*, *Oderflecken*, and *Erndtefieber*, which occurred in the basin of the Oder River and its branches near Breslau during the summer of 1891, doubtless in consequence of the floods of March. The first cases of the disease were noted about the middle of June, and in October the severity of the epidemic had passed, though isolated cases were observed as late as January, 1892. The disease occurred mainly in the rural districts and among young people, particularly those who worked in the flooded parts. In some places women especially were affected. The number of cases cannot be estimated, but it was very considerable. In some places it was estimated that one-fifth of the population was affected; in others as many as one-third or more. The disease began abruptly with chills, and the temperature rose to 40° or 41° C. on the first day. Soon the patient complained of headache and severe pains in the neck, back, and limbs. Often there was gastric pain, and occasionally vomiting. The face was usually flushed, the conjunctivæ injected, and the pupils contracted. General enlargement of the lymphatic glands was frequently noted, and often the spleen was a little swollen. The fever and symptoms continued in about the same manner for four or five days, sometimes as much as six or seven days, when an eruption appeared and the symptoms and temperature rapidly subsided. The rash was first noted about the clavicles, and resembled that of measles, but the spots sometimes enlarged to the size of small coins and frequently coalesced; occasionally petechial spots were noted. Herpes of the lips, face, and neck occasionally occurred. After the appearance of the rash the temperature generally fell in from two to four days to the normal, and sometimes there was a critical decline in a few hours. After the return to the normal there was considerable weakness and slow convalescence. Severe cases were rarely met with. Complications occurred in some. The latter rarely affected the kidneys or lungs, though pneumonia and pleurisy were met with. More conspicuous were the gastrointestinal complications. There was habitually pain in the stomach, sometimes violent in character, sometimes attended

¹ Münch. med. Woch., Oct. 2, 1894.

with vomiting, and in one case by bloody vomiting. The liver was often enlarged slightly, was tender; in a few cases jaundice was noted. As a sequel dyspepsia not rarely occurred. Relapses were very rare, unless a slight elevation of temperature occurring a few days after the first decline be considered as such. There were very few deaths.

[The study of the etiology of this disease tends to establish the facts that neither hygienic surroundings, food, nor water played a prominent part, but that working in the recently flooded district was an important element. There was never any evidence of contagion from person to person. The incubation was determined as usually from eight to twelve days. The nature of the disease has occasioned much discussion. Older physicians inclined to the belief that it was a mild form of typhus, but the benign character and the entire absence of contagion disprove this. Its resemblance to influenza was only superficial, and was excluded by the complete absence of respiratory symptoms and by the fact that influenza occurred subsequently in some of the affected districts and was easily distinguished. Malarial typhoid was excluded by the absence of the plasmodium. Gerhardt suggested dengue, and the similarity was not slight, but Müller regards the differences sufficient to exclude this disease. He himself indicates the resemblance in certain respects to Weil's disease, which may occur at times without jaundice. At all events, he would include both in the same group of diseases.]

MALTA FEVER.

Hughes¹ has studied clinically and bacteriologically the peculiar fever encountered at Malta and other Mediterranean ports. It resembles in some respects typhoid fever, in some respects malarial fever. It is, nevertheless, a distinct affection, and a peculiar microbe, differing from Eberth's bacillus, is found associated with it, while both the latter organism and the plasmodium of Laveran are absent. The temperature is irregular. There are periods of fever of remittent type, lasting one or two weeks and separated by apyretic intervals of two or three days. In grave cases the temperature is continuous, and death may occur in hyperpyrexia. In obstinate cases fever may last six months or more. It is unaffected by quinin or arsenic. There is obstinate constipation, anemia, and progressive debility. Neuralgic and rheumatoid complications or sequels may be prolonged for two years. Immunity from typhoid fever is not given by Mediterranean fever or from the latter by typhoid fever. The mortality is about 2 per cent. The mean duration of stay in hospital is from seventy to ninety days. The spleen is at first soft and enlarged. About the fifth or sixth week it becomes hard, and thereafter gradually shrinks to normal dimensions. The alimentary tract exhibits irregular patches of congestion, but Peyer's patches remain intact. The mesenteric glands are enlarged, but to a less degree than in typhoid fever. Grave cases exhibit bronchitis or bronchopneumonia. The micrococcus Meli-

¹ Annales de l'Institut Pasteur.

tensis is to be recognized morphologically and by culture. It has been found in the organs 8 times by Bruce, in 2 cases by Gipps, and in 11 cases by the author—21 in all. Bruce in 2 cases and the author in 4 cases reproduced the disease in monkeys by inoculation of pure cultures of the micrococcus *Melitensis*.

LEPROA.

Goldschmidt¹ contributes some interesting personal observations regarding leprosy on the island of Madeira. Leprosy was introduced into this island four centuries ago, and has retained its original characters. It has declined somewhat during the present century, but he thinks is slowly on the increase at present. There are now 6 cases to 10,000 inhabitants, about 70 in all on the island. As to the causation of the disease, his experience indicates that it is more common at higher elevations than at the seashore. This is at variance with the usual teaching, and he ascribes it to the improper and insufficient food of the mountaineers. Fish-eating has seemed of no importance in Madeira, nor any other dietetic consideration, except in so far as improper and insufficient food predisposes to disease in general. There is no evidence of direct heredity, but in the majority of cases leprosy is found in the parents, and its occurrence in the children of lepers is rather due to prolonged contact than anything else. His own experiments at inoculation from one person to another have failed in two instances. As to the clinical features, it is to be noted that there is no acute leprosy comparable to the acute forms of tuberculosis. Leprosy is always chronic. At its onset nasal or cutaneous involvement is first observed. Of the internal organs, the lungs and the spleen are first involved; later, the liver and intestines; the kidneys very rarely. Albuminuria is uncommon. The nervous system is frequently involved. In Madeira the population is divided between the sexes as 47.6 per cent. males to 52.4 per cent. females, whereas leprosy occurs as 69 per cent. men to 31 per cent. women. He has never seen a tuberculous subject acquire leprosy. In regard to treatment the localized lepromes of the early stages should be removed. Later he found iodoform an almost specific remedy, but to avoid the poisonous symptoms of this he substituted eucophen in 3 per cent. solution in oil of sweet almonds. Five cases treated with this gave 1 positive cure. The remedy may be injected or applied by inunction.

Marcano and Wurtz² report a case of leprosy in a child of twenty-seven months in which the disease began in a localized lesion, the nature of which was recognized by excision of a small piece. The area of involvement was removed surgically, as well as the surrounding anesthetic area. The wound healed quickly, and the complete cessation of the disease was still noted eight months afterward. They also refer to another case in which there was a small spot at the onset of the disease, which later became generalized, and in which excision might have been followed by similarly happy result.

¹ La Lèpre : Soc. d'Ed. scientif., Paris, 1894. ² Archive de Méd. experimen., 1891, No. 1.

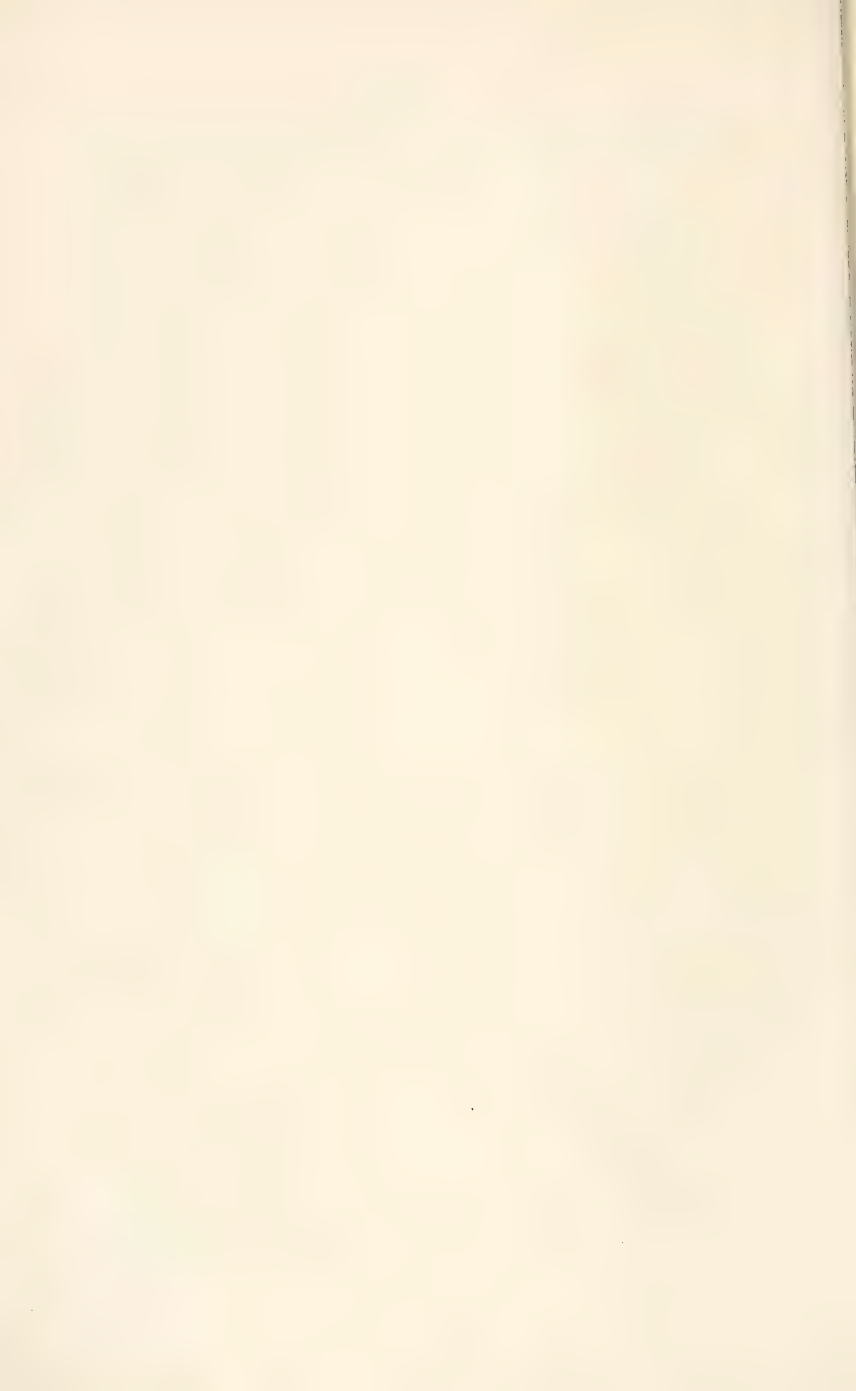


C. R., *et* 23.

(From Goldschmidt: *La Lèpre*, Paris, Soc. d'Éditions scientifiques, 1894.)



A. G., *et* 20.



HYDROPHOBIA.

Goldschmidt¹ describes an acute epizootic and epidemic outbreak of hydrophobia at Madeira, 300 dogs dying of the disease and 1000 others being killed on suspicion. There were 9 fatal cases among the inhabitants. The epidemic spread over the island with great rapidity, lasting for six months and ceasing suddenly.

THE BLACK PLAGUE.

Mary Niles² says regarding the bubonic plague raging in Canton that it is the same disease as the great London plague, and is characterized mainly by glandular enlargements. It had not appeared in the Canton district for forty years or more, though it is endemic in Yunnan. In some places it began in the winter, and she herself found the first case in Canton as early as January. Curiously, it was very erratic in its spread, appearing in one section of the city while subsiding in others. Unsanitary conditions are most important in the etiology; in no case was direct contagiousness found to exist. In an infected house the rats die first. High fever, stupor, delirium, or coma, with a petechial eruption and sometimes hemorrhages in the mucous surfaces, are prominent symptoms. The glands enlarge twelve hours after the fever begins, and may suppurate in cases that do not die in a short time. A remission of the symptoms is common on the second day.

SLEEPING SICKNESS.

Forbes³ contributes an interesting paper on the sleeping sickness of Africa. The disease may occur in either sex and at any age, though it is most frequent from the twelfth to the twentieth years and in the male sex. It begins with enlargement of the cervical glands, and drowsiness and sleep at unusual hours. At first the patient may be aroused, but later sinks into a heavy stupor or coma. Death occurs in from three to twelve months and is due to starvation. The author reports 11 fatal cases, and 2 that passed from observation. At the autopsy are found hyperemia of the arachnoid and slight chronic leptomeningitis and pachymeningitis. There is also anemia of the brain-substance. In 1 of his cases the spleen was enlarged. Regarding the nature of the disease, he inclines to the view that it is a neurosis.

GLANDERS.

Garstang⁴ records a case of glanders that recovered. A veterinarian was engaged in "drenching" a horse suffering with this disease, when the animal coughed, spattering his arm and face. He did not wash himself for some time. Eight days later a pustular rash began on the right arm, and then extended until it became almost general. The eruption appeared in successive crops, about twelve hours sufficing for the complete development

¹ Lancet, May 19, 1894.

³ Lancet, 1894, p. 1185.

² N. Y. Med. Jour., Oct. 13, 1894.

⁴ Ibid., March 16, 1895.

of the lesion. These were first small lumps under the skin, then points of suppuration which discharged, scabbed over, or left unhealthy ulcers. There was later a discharge from the nose and eyes, and a large quantity of pus was expectorated from the lungs. General health was much impaired, but under simple treatment was gradually restored and complete recovery ensued. Bacteriologic examination was negative, but a number of persons of experience concurred in the diagnosis.

ANTHRAX.

Poelchau¹ records a case of gastrointestinal and pulmonary anthrax occurring in a man of thirty-seven years, in which death ensued after five days' illness. The clinical features of the case were those of a profound intoxication, with some restriction or disturbance of the pulmonary function. The exact condition of the lungs could not be determined. There were no gastrointestinal symptoms. After death enlargement of the spleen, dark-colored ulcerations of the stomach and jejunum, gelatinous pleuritic adhesions, and moderate pericardial and abdominal dropsy were discovered. The splenic juice contained the bacillus of anthrax.

Eppinger² has contributed a most interesting study of anthrax as it occurs among the rag-sorters of the paper-mills near Graz, and which he identifies as the same form of disease as the wool-sorter's disease of English writers. The affection is known in Austria-Hungary by the name "*Hadernkrankheit*," and occurs more commonly among the women engaged in the work indicated than among the men or women otherwise employed about the mills. The onset is sudden as a rule, and the symptoms observed are high fever, followed by great depression of the body-heat, with collapse, pain in the side, painful and paroxysmal cough, cyanosis, great weakness of the heart, together with physical signs of pleuritic effusion and consolidation of the lung. Pathologically, there is serous exudation in the pulmonary alveoli and into the pleural sacs, and more or less extensive inflammation and erosion of the tracheobronchial mucosa. General infection of the system may ensue, with resulting enlargement of the spleen and gastrointestinal implication. Eight cases came under the observation of the author, in which accurate clinical and pathologic studies were made, and several other instances, less carefully studied, are detailed. The infection undoubtedly occurs in the respiratory tract, and in each of the cases studied the bacillus of anthrax was isolated.

DIATHETIC DISEASES.

RHEUMATISM.

Etiology.—Considerable evidence has accumulated regarding the infectiousness of acute rheumatism, but there remains undoubtedly an element

¹ Centralbl. f. Innere Med., April 13, 1895.

² Die Hadernkrankheit, etc., Jena, 1894.

of diathesis. Roos¹ records 4 cases in which articular rheumatism began with tonsillitis, and he inclines to the view that rheumatism is an infectious disease, the poison of which may gain entrance through a diseased tonsil. The absence of tonsillitis in many cases may be explained by assuming that, as a rule, the poison passes through the portal of entrance without causing local trouble. The interval between the angina and the rheumatism cannot be definitely stated, but sometimes it is two or three days, sometimes more. The special indications of a rheumatic angina are the severe pain, the great redness, and swelling.

Buss² contributes an interesting study of the relations of acute rheumatism and angina. He points out the frequent occurrence of the one condition before or after or in conjunction with the other. The modern tendency is to regard rheumatism as an infectious process, and in that case the tonsil is to be regarded as the portal of entrance of the infective cause. Buss himself thinks it due to pyogenic organisms of lessened virulence. Among these may be reckoned the pneumococci of Fränkel and the bacillus of Friedländer. According to his view, then, the disease is one due to several possible causes. The pneumococci-rheumatisms occurring either with or without pneumonia tend especially to suppuration.

Collin³ details a most interesting case bearing on the nature of rheumatism. The patient, a soldier-cook, had had rheumatism before. The attack in question began with violent sore throat, and was characterized by phlegmonous swellings, proceeding to suppuration, situated in the subaponeurotic and periaponeurotic fibrous tissues. The pus obtained by incision and the blood contained staphylococci. Later true rheumatic arthritis developed, and suppuration supervened in one knee-joint. The author's deductions regarding this case are that it shows that, in some cases, rheumatism of itself or in consequence of secondary infection may localize itself mainly in the fibrous tissues—that in this case the lesions were essentially infective, their localization due to the rheumatic diathesis.

Sacaze⁴ contributes a case of acute rheumatism that followed shortly after a suppurative wound of the foot. Cultures made from the wound showed the staphylococcus albus in pure culture. The author accepts the view of Sabli, who regards rheumatism as a form of mild septicemia.

Leyden⁵ refers to 6 cases coming under his observation of acute endocarditis complicating articular rheumatism. In each of these there was found a diplococcus differing from that of pneumonia and also from the ordinary streptococcus.

Newsholme⁶ delivered the Milroy Lectures on the Natural History and Affinities of Rheumatic Fever before the Royal College of Physicians of London. The subject is thoroughly discussed, and the weight of clinical evidence is held to point to a specific cause, although as yet undiscovered.

¹ Berlin. klin. Woch., No. 25, 1894.

³ Gaz. des Hôpît., 1894, 1057 et seq.

⁶ Deutsch. med. Woch., Dec. 6, 1894.

² Deutsch. Archiv für klin. Med., Bd. liv. H. 1.

⁴ Archiv. gén. de Méd., Nov., 1894.

⁵ Brit. Med. Jour., Mar. 9, 1895.

Muscular Rheumatism.—Leube¹ contends that muscular rheumatism is a general disease with local symptoms, and that the infective material is probably an attenuated form of the virus of acute articular rheumatism. Among 200 cases he found fever in about one-third. The temperature rarely exceeded 102° F. for two days in duration. In one-sixth of the cases there was a cardiac murmur that disappeared under treatment in one-half of the cases. In several cases this observer has seen joint-rheumatism following muscular rheumatism, and on one occasion half the beds in his ward were occupied by patients with this disease, so that there seemed to be an epidemicity.

[The opinion of Unverricht is that there is a form of disease distinguishable from rheumatism, and which he designates by the title dermatomyositis. Several interesting studies of this affection have recently appeared.] Herz² states that besides the cases of fatal dermatomyositis which he has observed there are instances of mild and favorable forms, in which swelling and pain of the muscles, redness and hyperesthesia of the skin, are prominent symptoms, and which are generally regarded as muscular rheumatism. These cases are probably infectious in character; they occur most frequently in young persons of the female sex, especially in servants. There is fever at the onset; in 1 case he observed swelling of the spleen, and the local symptoms soon developed, particularly about the extremities, and rarely in the respiratory muscles and those of deglutition. The tendons and their sheaths may likewise be involved, but the joints escape. In 2 cases the neighboring lymph-glands were enlarged. The fever soon disappears, and the general recovery follows in about two weeks, though the local symptoms are prone to be resistant.

Buss³ details a case of acute dermatomyositis in a young workman of twenty-two years, manifesting itself as an acute diffuse and painful swelling of numerous muscles, especially of the extremities. There was also an erythematous and measly eruption in the skin. The muscles offered a doughy resistance, and among the other striking symptoms were hemorrhages from the intestines and mouth, enlargement of the spleen, fever, and profuse sweats. The disease began with sore throat, and the author regards it as an instance of septic infection, the portal of entrance being the throat.

Rovere⁴ records a case of dermatomyositis occurring in the course of diabetes, and in which the staphylococcus pyogenes aureus was found in the pus of abscesses in the urine and in the exudation into one of the joints. Histological examination discovered myositis, and the postmortem revealed masses of staphylococci in the lungs, kidneys, and muscles. Clinically there was sudden pain in the joints and muscles, fever, swelling of the joints and muscles, and dropsy of the skin. Almost simultaneously widespread furunculosis developed. The author regards the condition as evidently infectious, the general disease predisposing to such infection.

¹ Am. Pract., May, 1894.

³ Ibid.

² Deutsch. med. Woch., No. 41, 1894.

⁴ Riforma Med., Nos. 155 and 157, 1894.

Treatment of Rheumatism.—Hasenfeld¹ has used salicylic acid in 25 cases in the form of a 20 per cent. ointment, which was rubbed into the skin. Fifty per cent. of the drug appeared to be absorbed into the body, and in most of the cases the therapeutic effect was most decided.

Erlanger² finds that salicylate of sodium may be satisfactorily administered in acute rheumatism by the rectum. The absorption is somewhat less rapid than by the stomach.

Moritz³ claims that the amount of salicylate of sodium necessary in the treatment of rheumatism may be decidedly lessened by the simultaneous use of hot baths. He bathes the patient in water having a temperature of from 100° to 105.8° F. every morning, and follows this by the administration of from 15 to 23 gr. of salicylate of sodium. At first from 45 to 60 gr. per diem are needed; later from 30 to 40 gr. suffice. The same treatment is efficient in other forms of rheumatism, and even in gonorrheal arthritis.

RHEUMATOID ARTHRITIS.

There can be little doubt that the nervous system is strongly involved in this disease, as J. K. Mitchell long ago maintained. Falli⁴ has investigated 3 cases to determine the ultimate pathology of this disease. In 2 cases the disease was typical, affecting the hands, the wrist, elbow, and shoulder, and in these, lesions were found in the anterior horns of the spinal cord, atrophic in the first case, but degenerative as well as atrophic in the second. In the third the disease was most marked in the shoulder-joint, and in this the morbid changes were faintly marked in the nervous symptoms, whereas the muscle and articulations were profoundly altered. He details a fourth case also, in which death occurred from tuberculosis, and in which cavities were found in the gray matter corresponding in situation to the points where the neuroglia was thinned and the cells most atrophied in the other cases. The author does not believe that these lesions were intimately related with the disease of the limbs. He, moreover, does not believe that all cases of arthritis deformans are to be explained as instances of nervous disorder.

ACID DYSCRASIA.

Cavazzani⁵ describes some of the features of what has been termed the diathesis arthritica, and the distinguishing features from the gouty diathesis. Some of these are that the attacks of joint-trouble do not occur in typical paroxysms, and rather in individuals who have suffered with vague rheumatic pains than in those of a gouty tendency. The pain may be in the fasciæ, in aponeuroses, or in the connective tissue in and around the joints, and finally in the nerves themselves. Disturbance of digestion, of blood-making, and of the general health of the patient may also be noted. Cold is a strong predisposing cause, and most of the cases recover with the occur-

¹ Pester med.-chir. Presse, No. 47, 1894.

² Jour. de Méd. de Paris, Feb. 3, 1895.

³ Med. Week, ii. p. 439, 1894.

⁴ Il Policlinico, Dec., 1894.

⁵ Riforma Med., Nos. 245, 247, 1894.

rence of warm weather. Oxaluria is a form of this diathesis according to the author, and requires the same general management. Alkaline treatment, particularly sodium carbonate, is useful as a prophylactic.

GOUT.

Tyson¹ discusses the points by which irregular or atypical gout may be known. They are—1, demonstration, if possible, of uricacidemia; 2, the supervention of an attack of regular gout; 3, history of former attacks of regular gout; 4, hereditary tendency to gout; 5, exposure to lead-poisoning; 6, habits of life; 7, presence of urine of high specific gravity with lateritious sediments; 8, presence of gouty glycosuria in the family; 9, chronic interstitial nephritis; 10, the result of therapeutics.

Debout d'Estrees² mentions parotitis, orchitis, and pneumonitis as rare forms of gout that he has encountered.

Marboux³ discusses the question of renal gout. Anatomically, there is hyperemia of the kidney, which may lead to albuminuria or sudden increase if albumin had already existed. There is considerable pain, and a resemblance to colic may be noted. In severe cases hematuria occurs, which when due to gout is practically always renal. Gouty renal colic is also a frequent affection, and is distinguished by the general appearance of the patient, by the presence of blood and albumin, and by the acute pain. The latter, however, is less acute than in case of stone.

Symes⁴ reports a case of obstinate hiccough in an old man of gouty habit, in which no cause excepting this general condition was discoverable, and in which treatment was unavailing. It continued for ten days, when it ceased as suddenly as it began. On the basis of this case he has made a general study of the symptom in question. The cases of severe and continuous hiccough may be classified as those due to inflammation of the peritoneum, intestines, or other parts; those dependent on irritation and reflex action in dyspepsia, worms, dentition, and the like; specific cases in which the cause is probably a circulating poison, as in gout or malaria; and the neurotic forms, as in hysteria, myelitis, and other nervous diseases. In considering the pathogenesis of hiccough he denies the prominent part that has so commonly been assigned the phrenic nerve. The treatment must first of all be directed to the correction of any underlying cause, after which attention is to be given to the general nervous system.

Kirk⁵ confirms the view of Pierce that pyorrhœa alveolaris is a constitutional rather than a local condition and dependent upon gout. He finds that tartrate of lithium in doses of 3 grains each acts as a prompt specific.

Tyrrell in a paper read before the Ontario Medical Association⁶ claims that lithemia is a strong predisposing factor in hay-fever, finding in his own person, as well as subsequently in others, that the administration of sodium

¹ Jour. Am. Med. Assoc., June 8, 1895.

² Lyon médical, March 3, 1895.

⁵ Lancet, June 30, 1894.

² Univ. Med. Mag., March, 1895.

⁴ Dublin Jour. of Med. Sci., Jan., 1895.

⁶ Pacific Med. Jour., Dec., 1894.

salicylate in doses of 15 gr. after breakfast served to prevent a threatened attack.

OBESEITY.

Leichtenstein,¹ observing in a case of myxedema treated with thyroid gland that the subcutaneous fat disappeared with the continuance of the treatment, was led to adopt this treatment for obesity itself, and reports striking results. The diet of the patients remained the same, and, as the appetite was not diminished by the treatment, the loss of weight is evidently due to other causes than altered alimentation. He holds that the observations in myxedema, in obesity, and psoriasis warrant the belief that the thyroid gland manufactures a material having a regulating influence upon the constitution of the panniculus adiposus and on the nutrition of the skin in general. Wendelstadt² details the cases on which Leichtenstein's deductions are based. There were 25 patients in all, in 22 of whom the effect was entirely satisfactory, the loss of weight amounting to as much as 9.5 kilos. Of the 3 cases in whom the result was not satisfactory, 1 had nephritis with severe Graves' disease, and the third psoriasis.

Charrin³ has used injections of thyroid extract, and has administered such in obesity with decided benefit. So soon as the administration of the remedy was stopped the loss of weight ceased, but with renewal of the administration loss of weight again ensued up to a certain point, beyond which the remedy seemed powerless to act.

Ewald⁴ also reports good results from the treatment of 3 cases of obesity by thyroid glands. In these cases there was a somewhat doughy character of the subcutaneous tissue, resembling that of myxedema.

MYXEDEMA.

Etiology.—[A number of observations have been recorded, showing that the disease of the thyroid gland in myxedema may be of various kinds. It has become clear also that there is widespread disorder of metabolism, doubtless dependent upon the thyroid disease.]

Pospelow⁵ describes a case of syphilitic disease of the thyroid gland following some years after primary infection. Clinically there were the symptoms of diabetes insipidus. Under specific treatment the swelling of the thyroid gland disappeared, but signs of myxedema then developed. Thyroid glands were administered, with relief of the myxedema, but reappearance of the diabetes, which in turn yielded to mercury. This, again, was followed by myxedema, and at the time of the report thyroid treatment was again instituted.

Köhler⁶ reports an interesting case of myxedema occurring in a woman of forty-eight years, in which the disease of the thyroid gland was actinomy-

¹ *Dentsch. med. Woch.*, No. 50, 1894.

² *Ibid.*

³ *Compt. rend. de la Soc. de Biol.*, Dec. 29, 1894.

⁴ *Berlin. klin. Woch.*, Jan. 14, 21, 1895.

⁵ *Monatsh. f. Prakt. Dermatol.*, Bd. xix. No. 3.

⁶ *Berlin. klin. Woch.*, No. 41, 1894.

cosis. After incision was made and the wound healed the symptoms of myxedema receded.

Sargent¹ has reported the case of a woman, fifty-five years old, who, ten years before coming under observation, had a generalized eruption of psoriasis, which disappeared in the course of a few months, but was soon succeeded by another, but finally there was no remission of the skin-lesion. The patient complained also of pains occurring paroxysmally, and referred especially to the small joints of the hands and feet and of the spinal column. The joints of the hands and feet became distorted like those of arthritis deformans. The head became strongly flexed on the chest, and could not be extended, efforts to do so giving rise to pain. The integument presented a livid hue, which was especially marked upon the arms and the thighs, where there was, besides, an abundant desquamation of large scales. In these situations the skin and the subdermal structures were infiltrated by a hard, smooth, and stiff edema, not pitting on pressure. The face was pale, the eyelids swollen, the expression fixed, the cheeks relaxed, the lips large and pendent. The intelligence was obscured and the memory impaired; the patient found difficulty in expressing herself and stuttered in speaking. All of the symptoms progressed slowly until death ensued. Upon postmortem examination the kidneys were found to be in a state of parenchymatous inflammation; the thyroid gland was much reduced in size; and the right lobe was relatively atrophied, while the left had almost entirely undergone calcareous degeneration.

Baldwin² contributes 4 most interesting cases in which myxedema occurred in persons who had previously suffered with Graves' disease, and in all of which treatment with thyroid extract proved most useful. The first occurred in a boy of ten four years after Graves' disease. The second affected a girl of fourteen two years after the exophthalmic goiter was cured. In the third, a girl of fifteen showed the first signs of myxedema five years after improvement from Graves' disease, and in the fourth, a woman of forty-four, four years later.

Gron³ records a case of myxedema occurring in a woman of sixty-two years, in which the autopsy showed a considerable enlargement of the pituitary body, and he collects the recorded instances of this association.

Gowan⁴ points out the relation between myxedema and Graves' disease, as shown by the probable nervous origin of each and the proportion of women affected in each to men.

Diagnosis.—Starr⁵ points out the distinguishing features between nephritis and myxedema. Two forms of nephritis must be distinguished. In the acute cases, when there is considerable edema, the resemblance may at first sight be striking, but some of the points of distinction are really very marked. The preference of the swelling in myxedema for the supraclav-

¹ Bull. de la Soc. anat. de Paris, 1894, fasc. No. 6, p. 180.

² Lancet, Jan. 19, 1895.

³ Centralbl. f. Innere Med., Jan. 19, 1895.

⁴ Lancet, Feb. 23, 1895.

⁵ Med. News, Dec. 15, 1894.

icular spaces and the region of the masseter muscles, as well as the abdomen, and the absence from the legs and back when these are the dependent parts, are in striking contrast with the well-known conditions of renal dropsy. Pitting on pressure is not noted in myxedema, and the onset is slow and progressive.

In chronic nephritis with contracted kidneys and hypertrophy of heart there is a still more confusing resemblance to myxedema. The polyuria with the low specific gravity and scanty traces of albumin and hyaline casts, as well as the slow course of the symptoms, the gastric and cerebral disorders and the pallor of the skin, are common to both diseases. It will be noted, however, that in chronic nephritis the dropsy is rarely extreme, and is uniformly seen about the ankles, or below the eye if the face is affected. The remarkable dryness of the skin with scaly desquamation, and the coarse, bristly character of the hair so characteristic of myxedema, are absent, and the extreme sensitiveness to cold is more characteristic of myxedema than of the other disease.

Tresilian¹ records a case of myxedema that had been regarded for a number of years as an instance of chronic nephritis. The patient was a man of sixty-four years, who had albuminuria and a weak heart. The disease progressed slowly for ten years, and first occasioned dyspnea and slowness of movement and weakness. Later he complained of great sensitiveness to cold and lack of perspiration. He was sallow and presented swelling about the eyes, especially after sleep. Early in the case there was considerable urine, the patient being disturbed at night to pass water, but later almost complete anuria developed. He was very weak when first placed upon thyroid treatment, and did not respond to it. Death occurred from syncope.

Treatment.—[The evidence in favor of the treatment of myxedema by thyroid glands and extracts is now wellnigh conclusive. With very few exceptions authors report entirely favorable results, and in the cases in which the effect was unfavorable the cause is usually discoverable in faulty preparations or over-doses. All writers of experience insist that the dose should be small, at least at first, and that the treatment should be kept up for a considerable period.] Mendel² records 3 cases cured by the administration of sheep's thyroid. He first used the juice hypodermically, but this was painful, and caused an abscess in one case; later he administered it internally.

Ayres³ records an instance in which improvement was striking. Large doses were at first given by some misunderstanding, and nausea, tremor, palpitation, and other unpleasant symptoms occurred.

Northrup⁴ reports 2 cases of myxedema occurring in a girl of nine years and a boy of twelve. In the former the disease began at the age of nine months. From that period the child ceased to develop either mentally or

¹ Med. Press and Circ., March 13, 1895.

² Jour. Nerv. and Ment. Dis., Aug., 1894.

³ Deutsch. med. Woch., No. 7, 1895.

⁴ Arch. of Ped., p. 793, 1894.

physically. In each case the treatment used was glycerin extract of thyroid glands, and there was some improvement in each, though especially in the latter.

Ewald¹ relates a case of myxedema greatly improved by thyroid tabloids, in which the thyroid extract was used without success. The case is notable in that sugar appeared in the urine during the administration, and ceased when it was discontinued. He refers also to the treatment of psoriasis, and especially to cretinism, and he has also used it in 2 cases of Graves' disease; in these, however, without benefit.

Harold² reports 2 cases in which the administration of thyroid gland by the mouth was of decided benefit in myxedema. One was a woman of sixty years, who showed decided improvement in ten days, and left the hospital practically cured in fifty days.

Another successfully-treated case is reported by Morie.³

Blake⁴ administered thyroid extract hypodermatically to a patient with myxedema who could not tolerate the extract by mouth.

Among the cases in which toxic symptoms were noted in consequence of overdoses the following may be referred to: Beclere⁵ reports a case which was eventually cured. By some mistake, excessive doses, 92 g. in eleven days, were given, when toxic symptoms developed. Among these were tachycardia, fever, restlessness, paresis of the legs, and sensory disturbances.

Schmidt⁶ records a case of myxedema in a girl of twenty years which had existed since the fifth year. There was a history of a fall with considerable concussion of the brain. At the time of his observation there were marked anemia, depression, psychic disturbance, lack of development, and other appearances of myxedema. Thyroid gland was administered, at first in rather large doses, with the result that in the course of eleven days decided improvement was seen in the skin and general condition, but the child suffered an uremic attack of great intensity, becoming stuporous for many hours, and finally convulsed. After a time the treatment was renewed, but smaller doses were given. Not until three months had elapsed, however, did growth begin to manifest itself. The author particularly warns against the use of large doses until the condition of the skin has materially improved, and he believes that protracted treatment is necessary before one may properly speak of a cure.

Abrahams⁷ records a case of myxedema in which the administration of thyroid extract in doses of 5 gr. daily was followed by decided improvement, and practically complete cure in six weeks. When larger doses were attempted there was invariably the immediate occurrence of untoward symptoms. And when the patient prematurely stopped the treatment, there was a mild relapse.

¹ Berlin. klin. Woch., Jan. 14, 21, 1895.

² Rev. de Thérap. Médico-chirurg., June 15, 1894.

³ Provin. Med. Jour., Leicester, Sept. 1, 1894.

⁴ Deutsch. med. Woch., Oct. 18, 1894.

⁵ Practitioner, Aug., 1894.

⁶ France méd., Oct. 19, 1894.

⁷ Med. Rec., April 6, 1895.

Tresilian¹ records a case that had progressed slowly for ten years. Thyroid treatment was begun when the patient was greatly reduced in strength, and did not stop the disease. He died soon after of syncope. [The treatment was evidently begun too late, and the failure is attributable to this rather than, as the author believes, to the lack of specific action.]

CONGENITAL MYXEDEMA.

Crary² would apply the term congenital myxedema to cretinism, and points out that the diagnosis depends on the same manifestations as in the acquired form in adults. He details 3 cases of ordinary myxedema, all of which greatly improved under the use of glycerin extract of lambs' thyroid administered by the mouth. In a fourth case, one of cretinism in a girl aged five in which the symptoms dated from the third month of life, there was also decided improvement.

Oddo³ records a case of myxedematous idiocy in a child of three and a half years. There was general lack of development, the child appearing not over eighteen months old. There was great pallor, excessive development of adipose tissue, arrest of development of the hair, open condition of the fontanelles, delay in the appearance of the teeth, and the general physiognomy of myxedema. Intelligence seemed entirely absent. The case is of interest especially in the fact that the subcutaneous infiltration consisted of fat rather than mucoid material. A single previous instance of this kind (that of Immerwol) is recorded. Under treatment with injections of thyroid extract, and the administration of the same by the mouth, the child recovered completely.

DIABETES AND GLYCOSURIA.

Etiology.—Considerable advances have been made in recent years toward the determination of the etiology of these conditions. Pavy⁴ in his Croonian Lectures on diabetes establishes certain radical differences from previous and, to a large extent, prevailing notions of the pathogenesis of diabetes. In the preliminary lectures he shows that not only can carbohydrate matter be hydrated by ferment and chemical action, but when in this condition of increased hydration can be transmuted by dehydration under the influence of protoplasmic action to substances having more complex molecules—amyloses; and that in both the vegetable and animal kingdom carbohydrates take part in the synthesis of proteids. Further, he shows that carbohydrates under the influence of protoplasmic action may be transformed into fat. He denies the old view that carbohydrate matter rendered soluble by hydration in the alimentary canal is carried to the liver, there to be stored up in part and eventually permitted to escape into the hepatic vein and general circulation; and holds that this theory is founded upon faulty

¹ Med. Press and Circ., March 13, 1895.

² Am. Jour. Med. Sci., May, 1894.

³ La Médecine infantile, Jan. 15, 1895.

⁴ British Med. Jour., June 23, 1894, etc.

observations. These were that the liver is more saccharine than other organs, that the blood leaving it contains more sugar than the portal veins, and that the blood on the venous side of the systemic circulation contains less sugar than that on the arterial side. Coming now to his own view regarding diabetes, he holds that the carbohydrates of the food are converted into fat by the protoplasmic action of cells in the intestinal villi, and enter the system in the same way as fats taken as such. In the liver glycogen is formed by the transmutation of the surplus carbohydrates that escape the action of the cells of the villi. Perhaps the glycogen stored in the liver eventually forms fat also, for there is evidence to prove that this organ has some fat-forming function. There are thus two barriers preventing the entrance of carbohydrate matter into the blood, and if either is deranged diabetes may result. Even in health both lines of defence may be passed if too much carbohydrate food be ingested. Regarding the ultimate cause of the deficient protoplasmic action in cases of diabetes, Pavy believes that there is an underlying nervous condition that first affects the circulation and thus eventually protoplasmic activity. [Throughout his lectures there is the evidence of careful and painstaking work, and it is not unlikely that future investigations will show the soundness of Pavy's observations.]

Regarding the exact quantities of carbohydrate food necessary (to adopt Pavy's expression) to pass the barriers of the intestinal villi and the liver so as to cause glycosuria, a number of observations are reported. Bloch¹ has experimented with 50 patients to determine the limit of assimilation (*Assimilationsgrenze*, Hoffmeister) for grape-sugar; that is, the quantity that can be given before glycosuria appears. This limit is lowest in nervous diseases, particularly cerebral affections, in some cases of which the quantity necessary to produce glycosuria was very small. Intestinal, circulatory, and respiratory diseases, as well as those affecting metabolism or the liver, did not exercise much influence.

V. Jaksch² contributes some interesting observations upon the same point. He found in women during gestation the administration of 100 g. of grape-sugar was followed by appearance of from 1 to 18 g. in the urine, and asks whether this might not be a test of value in diagnosis. He also finds frequently alimentary glycosuria in the course of traumatic neuroses, and in cases of phosphorus-poisoning in which fatty degeneration of the liver has occurred 20 per cent. of the sugar administered is excreted in a few hours.

Brunelle³ believes that there is in lead-colic a certain amount of disturbance of the function of the liver due to direct action of the lead upon the hepatic cells. This is evidenced by the occurrence in the urine of altered biliary pigments, by the subicteric hue of the conjunctiva, and by the diminution of urea in the urine. In 11 of 21 cases he found, in addition, that the taking of from 150 to 300 g. of syrup caused the appearance of sugar in

¹ Zeit. für klin. Med., Bd. xxii. H. 525. ² Centralbl. f. Innere Med., May 25, 1895.

³ Archiv. gén. de Méd., Dec., 1894.

the urine. This glycosuria was fleeting—a fact that he attributes to the trivial nature of the cellular lesion in the liver.

Marcuse¹ contributes some suggestive experimental evidence to show the part played by the liver in the development of pancreatic diabetes. In 19 frogs in which the pancreas was extirpated, 12 became diabetic by the second day at the latest, and lived from two to eight days. In 21 cases in which the liver also was removed not one excreted sugar, though several lived a number of days. The author does not arrive at definite conclusions regarding the part played by the liver, and does not consider favorably the view that by the removal of the liver there is removed the organ or part in which the sugar is produced after extirpation of the pancreas.

Of interest in connection with v. Jaksch's discovery of the ease of producing alimentary glycosuria in persons suffering with traumatic neuroses, is the paper of Ebstein,² embodying an exhaustive study of the relation of traumatic neuroses to diabetes. He bases his remarks upon 6 cases under his own observation, and 44 others collected from the literature. He believes that there can be no question of the direct causal relation of traumatism to certain cases of diabetes, and remarks that, though this view has often been expressed, definite proof has not been so easily obtainable. In a half of the cases the injury affected the head. In 15 there were multiple injuries, and particularly general concussion of the body.

Reichel³ in a discussion of the theories of diabetes refers to a form of vasomotor or nervous glycosuria that he regards as related to the alimentary forms of the disease in that it is indirectly due to affection of the liver. As a consequence of experimental injury or the actions of poisons or pathologic conditions the vasomotor system is influenced, with consequent hyperemia of the liver and greater output of glycogen. Experimental sections of the splanchnic nerve prevents the congestion of the liver, and therefore prevents the glycosuria. Reichel would classify the forms of diabetes on the physiologic basis, separating forms in which the assimilation or consumption of sugar is interfered with from those in which the destruction is more or less developed.

Leidy⁴ records 3 cases in which glycosuria was found during and after attacks of appendicitis, and Broadbent⁵ records 1 occurring as a sequel of influenza in a girl of four years. The symptoms were those of a severe diabetes following a short attack of jaundice. The disease at the time of the report had existed for three years, and the patient suffered with the usual symptoms and also with obstinate constipation and neuralgia. The knee-jerks were diminished. The case was still under observation at the time of the report.

Symptoms and Diagnosis.—Grube⁶ describes as "gastric crises" certain attacks of vomiting with severe colicky pain, dry, coated tongue, and

¹ Zeitsch. f. klin. Med., xxvi. H. 3 u. 4.

² Deutsch. Archiv f. klin. Med., April, 1895.

³ Wiener med. Woch., Nos. 29 and 35, 1894.

⁴ Med. News, Sept. 29, 1894.

⁵ Lancet, Sept. 15, 1894.

⁶ Münch. med. Woch., No. 7, 1895.

cramps of the calves occurring in the course of diabetes. These attacks are usually accompanied by febrile reaction, and their duration is from a few hours to several days. The author regards the cause as an irritation of the vagus nerve by the circulating toxins in the blood, and in regard to treatment advocates particularly free use of laxatives. [We have noted similar attacks in several cases, and in some it has seemed to us that the epigastric cramp was rather of the same sort (affecting the diaphragm) as the cramps in the muscles of the legs, than due to involvement of the vagus.]

Unschuld¹ claims that an early sign of value in the detection of diabetes is the tendency to cramps in the calf of the leg. These show themselves in the morning on awakening or sometimes during the night, but not during the day. He found such in 26 per cent. of his cases. In 1891 he found it in 33 of 109 cases. It is absent in the acute diabetes of young persons.

Regarding the early diagnosis of diabetes mellitus, v. Noorden advocates the administration of grape-sugar to test the occurrence of glycosuria. In 15 fat persons in whom the most liberal starchy diet was followed by no trace of sugar, the administration of 100 g. of chemically pure grape-sugar was followed by glycosuria within an hour. Two of these persons developed diabetes some years later; in the others time has not yet elapsed sufficient to determine the outcome of the cases. He advocates the frequent application of this test in gouty persons for diagnostic purposes.

Bremer² claims to have discovered a new reaction in the blood characteristic of diabetes and simple glycosuria. The blood is prepared as in the ordinary methods of staining, heated, and stained with solution of eosin and hematoxylin, which is prepared so as to be neutral in its color-reaction—*i. e.* there is scarce any coloration of a slip of paper dipped into the solution. In cases of glycosuria from any cause the red corpuscles assume a reddish-brown color with this stain. Moreover, he finds in the blood small granular masses, best demonstrated by Gram's method of staining, which he regards as similar to the so-called elementary granules of the blood and as of somewhat diagnostic significance.

An interesting case of diabetes occurring in a child of fourteen years is reported by Comby.³ The lad had shown excessive thirst for two months, and great polyuria at the same time; rapid emaciation ensued. The quantity of urine was 6 liters, and there were 65 g. of sugar per liter. Under treatment marked improvement occurred, but a relapse proved speedily fatal seven months after the disease began. The case is classified as one of pancreatic nature.

In a discussion upon diabetic coma introduced at the Berlin Association for Internal Medicine by Hirschfeld,⁴ the author spoke of a group of cases in which with even moderate glycosuria occurring in old persons coma supervenes under the influence of gangrene or carbuncles. The percentage of acetone rises and falls parallel with the condition of the wound. Fränkel

¹ Berlin. klin. Woch., No. 28, 1894.

² Med. News, Feb. 9, 1895.

³ Méd. moderne, No. 86, 1894.

⁴ Centralbl. f. Innere Med., No. 18, 1895.

referred to an instance under his observation affecting a girl of fifteen years, who, in spite of general improvement to the extent of 30 lbs. in weight, developed coma after an alveolar abscess that became gangrenous. Karewsky maintained that the coma in these cases is septic in nature, and referred to the unhealthy appearance of the wound that usually attends these cases. Stadelmann, on the other hand, believes the coma to be purely a matter of acid-intoxication, though the exact acid in question must remain in doubt. Weber¹ believes that some cases of diabetes may develop coma from heart-failure without the intoxication by acetone or diacetic acid.

Treatment.—In a clinical lecture on diabetes S. Solis-Cohen² states that he has used levulose in 12 cases of diabetes, and has found in all of them that this form of sugar is assimilated without increasing the excretion of the ordinary form of sugar. With lean patients he uses an ounce a day; with stout persons, only enough to act as a sweetening agent. He has also made a number of observations with lactose that show that this form is likewise assimilated. As a general rule in the treatment of diabetes, he advises that the diet be strict enough to diminish the polyuria and glycosuria and to secure their disappearance, provided the patient remains comfortable with the amount of restriction this would entail. Hale White³ also considers levulose a useful food in diabetes. More sugar appears in the urine, but there is less than would be present if the same quantity of sugar as before were excreted plus the levulose administered. In some cases there was distinct gain in weight, and none of the patients felt worse.

Bohland,⁴ on the contrary, found in 2 cases of diabetes quite different results from the administration of levulose, and concludes that this food will be found to possess very limited usefulness in the treatment of the disease in question. [The whole question of the usefulness of these forms of sugars, levulose and lactose, must be considered as very much in doubt.]

Hirschfeld⁵ in an investigation regarding the action of alcohol in diabetes concludes that from 30 to 70 c.cm. are completely destroyed within the body, and that therefore other nutritious matter is spared. [It would seem from his investigations that moderate quantities of alcohol may be permissible, and may lead to an accumulation of flesh.]

Williamson⁶ recommends biscuits composed of aleuronat and cocoanut powder in diabetes. The latter constituent is substituted for the flour usually employed in making aleuronat biscuit. The small amount of sugar in the cocoanut powder is removed by fermentation with yeast, and a paste is then made of the flour and the aleuronat; and an egg and a little saccharin and water are added, sufficient to make a dough, which is baked in the form of biscuit. Stern⁷ advises the use of bread made from peanut-flour for diabetics.

¹ N. Y. Med. Jour., Aug. 18, 1894.

³ Guy's Hosp. Reports, vol. I., 1894.

⁶ Berlin. klin. Woch., No. 5, 1895.

² Ther. Gaz., May 15, 1894.

⁴ Therap. Monatshefte, Aug., 1894.

⁶ Brit. Med. Jour., April 27, 1895.

⁷ Med. News, June 8, 1895.

Williams¹ tried the effect of pancreas extract and grafting of the sheep's pancreas in the treatment of diabetes in 2 cases, but in neither with any satisfactory result.

Lepine² reports the results observed in 4 cases of diabetes treated with glycolytic ferment obtained from the diastase of malt. In each case there was a notable reduction in the mean quantity of sugar excreted in the twenty-four hours, the most striking reduction being from 41 g. to 11 g. The ferment is not diuretic, and has no injurious effects, but the improvement is only temporary.

Clark³ details a case of diabetes insipidus treated with raw suprarenal glands. The condition had existed for about a year, and the patient passed about 4 gallons of urine in the twenty-four hours. She took one-half of the suprarenal capsule of the sheep, chopped fine and taken in a small sandwich every third night. Very soon there was decided improvement in her general condition, and the urine was reduced to 3 pints in twenty-four hours. Failure to take the remedy was followed by relapses. The patient also became much stronger, but did not improve in weight.

DISEASES OF THE BLOOD AND OF THE DUCTLESS GLANDS.

DISEASES OF THE BLOOD.

Miscellaneous.—[Questions of enormous importance remain to be settled regarding anemia and other disorders of the blood. The extent to which the condition of the circulating blood is influenced by certain disorders of the circulation itself remains to be established; as does also the degree and kind of change that may be exercised upon the blood by influences affecting the circulation, such as hot and cold bathing, massage, changes of barometric pressure, and the like.]

Jaruntowski and Schroeder⁴ have studied the question of the influence of altitude above sea-level upon the blood at Goerbersdorf, where the elevation is 561 meters. They found that the average estimation of the blood of 10 healthy men was 5,800,000 red corpuscles and 98 per cent. of hemoglobin, and of 10 healthy women 5,244,000 red corpuscles with 98.5 per cent. of hemoglobin. The direct relation of altitude to the increased number of corpuscles observed is seen very well in the table arranged by Wolff, to which they add their own observation at Goerbersdorf. This shows the number of corpuscles:

¹ Therap. Gaz., Oct. 15, 1894.

³ Brit. Med. Jour., May 18, 1895.

² Sem. méd., April 24, 1895.

⁴ Münch. med. Woch., No. 48, 1894.

At Christiania	Sea-level	(Laache)	4,970,000
" Göttingen	148 m.	(Schaper)	5,225,000
" Tübingen	314 m.	(Reinert)	5,322,000
" Zürich	414 m.	(Stierlin)	5,752,000
" Auerbach i. V.	400 to 450 m.	(Wolff)	5,748,000
" Goerbersdorf	561 m.	(Jaruntowski and Schroeder)	5,800,000
" Reiboldsgrün i. V.	700 m.	(Wolff)	5,970,000
" Arosa	1800 m.	(Egger)	7,000,000
The Cordilleras	4392 m.	(Viault)	8,000,000

In examining the blood in diseased persons they found the average of 15 cases of pulmonary tuberculosis in the beginning stages 6,115,000 red corpuscles with 98 per cent. hemoglobin; the average of 8 moderately advanced cases 5,781,000 with 84 per cent. of hemoglobin, while that of 4 well-advanced cases with fever was 4,954,000 and 79 per cent. of hemoglobin. Noting the condition of the blood at the time of arrival and at intervals of a week thereafter, they found by the end of the third week among healthy men and women, as well as among the milder cases of pulmonary tuberculosis, an increase of from 13 to 16 per cent. in the number of corpuscles and from 6 to 9 per cent. in the proportion of hemoglobin. In cases of more advanced disease the gain was not so considerable nor so regular. Experimentally, they showed that the blood of a guinea-pig increased in richness 1,140,000 per cubic millimeter when the animal was kept under a glass jar at a barometric pressure of 624 mm. for fifteen days.

Vacquez¹ finds the number of red corpuscles increased and the proportion of hemoglobin elevated in cases of cyanosis due to cardiac disease. In marked cyanosis of considerable duration there is also noted increase in the size of the red corpuscles. Gibson² reports the case of a boy similarly affected in whom the blood-examination showed 8,470,000 red corpuscles and 110 per cent. of hemoglobin. He ventures the explanation that in venous stasis the processes of metabolism and oxidation are so interfered with that the corpuscles do not so soon perish from the wear and tear of use, and thus accumulate.

Mitchell³ contributes a very interesting and important paper upon the effect of massage upon the blood, as determined by the usual examinations of a drop obtained by pricking the finger. In all there were 35 cases examined, and in all but 3 there was a notable increase in the number of the corpuscles, and usually also in the proportion of the hemoglobin. The author very properly remarks that the increased richness of the blood in these cases does not result from a production of blood-corpuscles, but rather from the sweeping into the circulation of corpuscles that had lain in the byways of the circulation. [Mitchell's paper is one of great suggestiveness, and may furnish some added clue to the manner in which massage aids the nutritive processes of the organism. It has long been known that changes of position of parts of the body affecting the circulation bring about changes in the

¹ Comptes rendus de la Soc. de Biol., March 8, 1895.

² Lancet, Jan. 5, 1895.

³ Am. Jour. Med. Sci., May, 1894.

richness of the blood circulating in those parts. We have ourselves been able to confirm other writers who asserted that the blood of the finger held in air is appreciably poorer in red corpuscles and hemoglobin than that of the toe. The same explanation, advanced by Mitchell and by others, that there are corpuscles lying in the byways of the circulation that may readily be removed, has occurred to us in connection with these investigations regarding change of position.]

LEUKOCYTOSIS.

Goldscheider and Jacob¹ contribute a most interesting experimental study of leukocytosis that throws much light upon this important question. They found in the cases in which hypoleukocytosis was produced by injections of albumose or other substances, that the leukocytes collected in immense numbers in the capillaries of the lungs, without there being any evidence of destruction of the leukocytes. Subsequently, in the stage of hyperleukocytosis there was for a time still greater accumulation of leukocytes in the lungs, and only after a continuance did the number decrease and evidences of destruction of the white blood-cells assert themselves. Enormous accumulation of leukocytes could be produced in the lungs by inducing renewed hypoleukocytosis by injecting bacteria into the veins after hyperleukocytosis had been present. The theory of the authors is that the hypoleukocytosis is caused by an arrest of the leukocytes in the capillaries of various organs due to adhesion, and not at all to destruction of white corpuscles. The hyperleukocytosis following is due to the output of white cells from the blood-making organs of the body.

Ewing² has published some interesting experiments bearing on the same questions. Like the last-named investigators, he finds no evidence of active leukocytolysis in the stage of toxic hypoleukocytosis. He feels warranted in asserting that the appearances presented by the endothelium of certain of the blood-vessels in which the leukocytes accumulate may be taken to suggest an active part in detaining the white blood-corpuscles. This was especially marked in the liver.

A number of authors have come to somewhat similar results without increasing knowledge regarding the subject any further.

[For the discussion of leukocytosis in malaria, typhoid fever, pneumonia, etc., see these headings.]

Maxon³ has studied the question of the proportion of water and albuminous substances in the blood in various diseases, and concludes that the solid substance and albumin and hemoglobin increase and decrease proportionately, so that the quantity of the one will determine the quantity of the other. Like other investigators, he finds that the watery portion of the blood is decreased below the normal in cases of cardiac disease. Only in anemia and chlorosis is the albumin of the blood decreased and the water

¹ Zeitsch. f. klin. Med., Bd. xxv. p. 373.

² N. Y. Med. Jour., March 2, 1895.

³ Deutsch. Archiv f. klin. Med., Sept., 1894.

increased, and in these diseases, as in others, there is a constant relation between the proportion of albumin and of hemoglobin.

COAGULATION.

Wright¹ contributes a further article on methods of increasing and decreasing the coagulability of the blood. By direct admixture of calcium chlorid the time required for coagulation may be greatly reduced, and he has also been able to render the circulating blood more coagulable in persons to whom this remedy was administered. The continued administration of this substance, however, is not effectual in keeping up increased coagulability, and he has therefore suggested a further method, that of giving carbon monoxid by inhalation. This may be administered from a gas-bag through an inhaler in which a proper admixture of ordinary air or oxygen may be supplied.

Thompson² has investigated the effect of the administration of thyroid gland upon the coagulability of the blood, and finds that there is contained some substance, possibly a ferment, that may be extracted by glycerin or otherwise, and that hastens the coagulability of the blood and increases the firmness of the clot.

LIPEMIA.

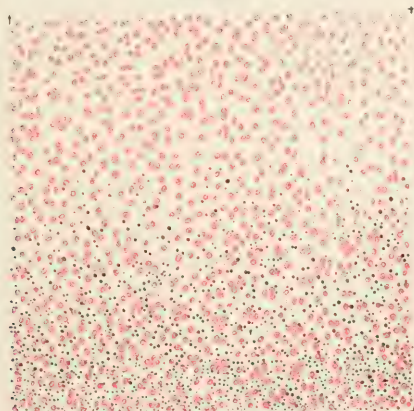


FIG. 3.—Blood from a case of lipemia, stained with osmic acid. Upper half of field cleared with oil of turpentine; lower half shows the fat-droplets and granules, stained with osmic acid, between the blood-corpuscles. Enlargement, 100 diameters (after Gumprecht: *Deutsch. med. Woch.*, Sept. 27, 1894).

Gumprecht³ reports a case of lipemia, and reviews the subject in general. His patient was a young man of twenty-one years, who worked in a brewery, where he drank beer immoderately; a dried specimen of his blood

¹ *Brit. Med. Jour.*, July 14, 1894.

² *Med. Rec.*, Apr. 13, 1895.

³ *Deutsch. med. Woch.*, No. 39, 1894.

stained with eosin disclosed great excess of fat. Lipemia is a condition that occurs in a great variety of disorders, and that gives rise to no distinctive symptoms, though dyspnea, languor, and vertigo are sometimes present as a result of interference with proper respiratory oxygenation. The condition is usually transient.

Treatment of Anemia.—Bunge at the Kongress für Innere Medicin, held at Munich in April, again maintained, on the ground of his own observations and of others, that inorganic preparations of iron are not absorbed from the intestinal canal or stomach in notable quantity. The reverse may be said, however, of certain organic compounds, such as occur in the form of nuclealbumin, in the yolk of eggs, and in milk and various compounds, as well as in vegetable foods. The last named are very rich in iron. The quantity in milk is inconsiderable. In the treatment of anemic conditions the rational suggestion would be the use of vegetable diet and of preparations of iron having similar composition. Quincke in the discussion following the former lauded the oxalate of iron as a particularly useful preparation and recommended also the albuminate. Hayem¹ also prefers the oxalate to other forms of iron, and administers it in doses of from 3 to 6 gr.

Kobert² has contributed an extensive study of the relations of iron to diet. The daily amount required, he thinks, is about 50 g. Iron is supplied by vegetable foods of various kinds, and perhaps in sufficient quantity for the needs of a healthy individual, but not enough for one suffering with anemia. A larger quantity is furnished by animal foods, particularly milk, eggs, liver, and blood. The combinations in the first three are stable, and therefore not so serviceable as those found in the last. Certain iron-containing derivatives of blood may be used with success in anemia. Of such, hemol and hemogallol are particularly useful. In addition there are certain artificial products having definite value, among which he rates ferratin. Kündig³ has experimented considerably with this substance to show that it is absorbed into the organism, and has used it clinically. He found that it acted more quickly in anemia than any other preparation of iron, and did not disturb digestion or the action of the bowels. He has used two preparations—one insoluble in water, and the other, a combination with sodium, soluble. Experimental investigations showed that 40 per cent. of the ferratin is absorbed. Dr. Fillipi⁴ also mentions that ferratin is a useful remedy in anemia, and Harold⁵ has used it in the treatment of 3 typical cases of severe anemia, and has found it a valuable remedy. Two of the cases were the ordinary hospital out-patients; the third was an in-patient. No digestive or constitutional disturbances resulted.

Castellino⁶ contributes an interesting study of hemolysis, and the effect of substances, particularly bichlorid of mercury, that prevent it. He con-

¹ Wien. med. Presse, xxxv., 1894.

² Deutsch. med. Woch., July 12 and 19, 1894.

³ Deutsch. Arch. für klin. Med., liii., Nos. 5 and 6, 1894.

⁴ Ziegler's Beiträge zur Path. Anat., Bd. xvi. Heft 3.

⁵ Pract., Aug., 1894.

⁶ Wien, 1894, A. Hölder.

cludes that all substances that destroy the blood cause changes in the composition of the urine, increasing the uric acid, the acidity, and toxicity, and decreasing the urea. Mercuric chlorid, administered in large doses hypodermically in cases of anemia due to active hemolysis, retards the destruction of the red corpuscles, decreases the quantity of hemoglobin in the blood-plasma, and increases the alkalinity of the plasma. The changes noted in the urine are the reverse of those found when hemolytic substances are at work.

CHLOROSIS.

V. Noorden¹ in a paper on chlorosis maintains the view that this disease is distinctly hemogenic, and not due to excessive blood-destruction, inasmuch as no excess of bile is found in the stools nor any unusual excretion of iron in any other way. As to the cure effected by iron, he thinks it is improbable that iron simply supplies the need, for the patients habitually take enough iron in their diet to supply that purpose. Iron, as well as arsenic and other remedies, simply acts by stimulating normal hematogenesis.

Meinert² contributes an exhaustive study of chlorosis, particularly in relation to the abdominal conditions occurring in that disease. He is struck

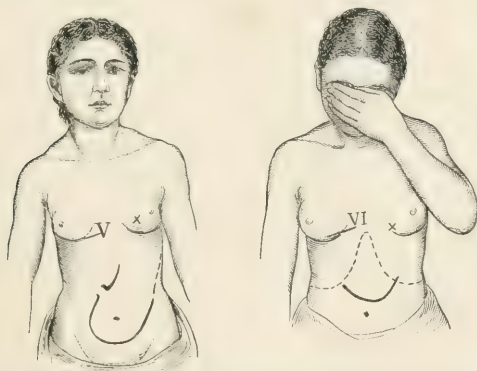


FIG. 4.—Case of enteroptosis (gastroptosis) and chlorosis: spontaneous recovery after eighteen months (modified from Meinert).

particularly by the frequency of enteroptosis in this disease, and regards the essential pathology of the affection as a neurosis dependent upon the descent of the stomach and consequent irritation of the solar plexus. The frequency of the affection in girls is accounted for by the injurious effects of improper clothing during the period of rapid development. In cases of descent of the other abdominal viscera high-grade secondary anemias differing somewhat from chlorosis are met with, and probably are the result of irritation of other

¹ Berlin. klin. Woch., Nos. 9 and 10, 1895.

² Sammlung klin. Vorträge, Jan., 1895.

nervous plexuses. In the case of chlorosis the nervous affection leads to disturbance of the blood-making function in the spleen, and the author therefore regards chlorosis as a secondary anemia of neurotic origin, and not a disease *sui generis*.

Taylor,¹ in a communication on the subject of chlorosis, calls attention to the frequent occurrence of pain in the flanks or immediately under the short ribs, more common on the left than on the right side. This he believes is due to colonic distention and a C-shaped deformity of the transverse colon. Regarding the nature of the disease, he agrees with Meinert in believing that there is an underlying nerve-disorder, and that chlorosis is but a secondary condition.

Murri² holds that cold is a powerful factor in the production of chlorosis. In proof of his view he states that 54 of his cases occurred in the winter months and but 11 in the summer. Exposing chlorotic girls to cold bathing, he found a primary and very transient increase of the red corpuscles, followed by more lasting and decided decrease. In dogs in which biliary fistulæ had been made he found cold bathing caused treble the normal excretion of iron in the bile and urine. In other words, there was decided increase of hemolysis. This, he thinks, is due to congestion of the intestinal vessels. [Chlorosis, according to this view, is dependent upon vasomotor conditions that may be brought into play by cold or other irritations, notably genital disturbances. There is undoubtedly some justification for the view that this explanation is at least partly applicable.]

Martin³ points out that chlorosis, though extremely infrequent in males, does sometimes occur, and he reports 4 cases in which he would make this diagnosis. He bases this upon the reduction of hemoglobin and the absence of definite symptoms of any other disease. [Though we agree with him that chlorosis occasionally occurs in the male sex (and we have ourselves seen typical cases with enormous reduction of hemoglobin), we cannot agree that his reported cases are instances of this nature. We would specially call attention to the fact that almost every secondary anemia shows as markedly disproportionate reductions of hemoglobin as do his cases.]

PERNICIOUS ANEMIA.

[There is not a little uncertainty regarding the nature of this disease, as well as regarding the features that may be considered as establishing the diagnosis. Certain writers have taken up the last question, and endeavor to establish the clinical identity of the cases in which no cause at all is discoverable and those in which definite causes are found.]

Stockton⁴ maintains that pernicious anemia is not a special disease, but is secondary to numerous exhausting conditions that induce an initial anemia. This anemia is followed in certain cases by degenerative changes in the blood-vessels, leading to capillary hemorrhages that by their constant

¹ Medical Press, Dec. 19, 1894.

² Brit. Med. Jour., July 21, 1895.

³ Policlinico, May, 1894.

⁴ Ibid., May 4, 1895.

repetition and their extent induce an excessive degree of anemia. In some instances external bleeding when repeated may lead to the same form of anemia. He holds that the hemogenesis is for a long time able to cope with the excessive loss of the blood, but eventually succumbs. The anemia of ankylostomiasis, he thinks, is essentially due to the losses of blood incurred. While admitting that Hunter may be correct in assuming that the blood is broken down by toxic agents in some cases, he does not strongly support such a view. [It seems to us that the author overestimates the importance of hemorrhage; and we would in particular note that some of the most violent instances of pernicious anemia due to ankylostomiasis have been found in persons in whom but few parasites were found, and in whom but little hemorrhage had therefore taken place.]

Stengel¹ points out the entire similarity, clinically and in the condition of the blood, between the forms of anemia caused by gastric atrophy, intestinal parasites, and pregnancy, with those cases called true Addisonian pernicious anemia. The only difference is that causes are found in the first group, and not in the second. The true nature of the cases is probably the same, and in all probability pernicious anemia is always a secondary disease, due to hemolysis mainly originating in the intestinal tract, with hemogenesis too poorly maintained to counterbalance the hemolysis. The diagnosis of pernicious anemia, he thinks, is therefore to be made when the blood has the well-known properties and the clinical symptoms are the usual ones of Addisonian anemia, irrespective of the presence or absence of an apparent cause. In the treatment of pernicious anemia he urges that attention be directed to the gastrointestinal tract, and that all other treatment be not neglected on account of the happy action of arsenic in some cases. Lavage, antisepsis, general massage, and good food are often just as necessary as arsenic.

Silva² believes that staphylococcus and streptococcus infections may assume the clinical appearances of pernicious anemia, and in support of this view reports 2 cases of rapidly increasing anemia lasting respectively three and a half months and nineteen days. In each the blood contained the staphylococcus pyogenes albus. At the autopsy the first proved to be pernicious anemia; the second was found to be a cryptogenetic infection. Cases like the second he would regard as symptomatic pernicious anemia, in the same class as the cases following intestinal parasitism, autointoxication, and like causes. He found the filtered products from cultures of his second case produced rapid anemia in animals injected.

Hirsch³ calls attention to the frequency of pernicious anemia in the tropics, and analyzes 126 cases seen in Fiji in the course of a year. But 26 of these recovered entirely; 41 died. In 40 cases it was shown that the affected persons were earth-eaters. The disease began gradually, and a noticeable feature was the absence of hemorrhages, even retinal hemorrhages

¹ Therap. Gaz., June, 1894.

² Rif. Med., Nos. 218, 219, 1894.

³ Lancet, Dec. 1, 1894.

occurring in but 8. Mild edema was frequent. Severe dropsy occurred in 51, and of the fatal cases three-quarters died with general anasarca, ascites, and edema of the lungs. Ankylostomiasis was frequently present, though never in severe form. The treatment most effective was salol, and increasing doses of arsenic following a single dose of filix mas. The postmortem study [made in all fatal cases] showed enlargement of the spleen in 7; interstitial nephritis in 1; cheesy degeneration of the suprarenal capsules in 1 (probably Addison's disease); hyperemia of the stomach in 4; congestion of the intestines in 4; ulceration of the duodenum twice; and in 18 ankylostoma, though in small numbers. The author believes the action of the parasites to be hemolytic; that is, it leads to the production of ptomaines, which are absorbed from the intestine. [Sandwith has also recorded an extensive series of cases of ankylostomiasis, which will be referred to in the section on Animal Parasites.]

Bohland¹ has made careful investigation regarding metabolism in 2 cases of ankylostomiasis with marked anemia, and finds that there is undoubted evidence of abnormally increased albuminous destruction. He does not believe that losses of blood due to the parasites occasion this altered metabolism, in view of the previous observations of various observers in cases of hemorrhage. He inclines rather to the belief in the production by the parasite of some substance destructive to the blood and albuminous tissues—[a view in which we are disposed heartily to concur].

[The diagnosis of pernicious anemia may be more or less obscured by the prominence of nervous symptoms, and it is likely that some cases of spinal disease may follow after unrecognized pernicious anemia, which itself has disappeared, but has left the spinal disease.] Burr² reports the examination of the spinal cord in 7 cases of pernicious anemia and in 1 of severe secondary anemia. In all but 1 of these cases of pernicious anemia there was sclerosis of the posterior columns, especially in the cervical region. In the lumbar cord it was slight or absent. The only parts of the cord ever affected are the posterior columns, the lateral columns in and near the crossed pyramidal tracts, the direct pyramidal tracts, and rarely a band running upward along the circumference of the cord (cerebellar tracts). The gray matter is rarely affected. The brunt of the trouble always falls upon the posterior columns; they may alone be affected, but the other columns are never alone involved. The lesion is symmetrical in the two halves of the cord. Burr regards this lesion as the effect of toxemia similar to that occurring in pellagra and ergotism. The absence of decided symptoms is rather remarkable.

Dr. James Taylor³ reports 2 cases, both of which are somewhat unusual as showing symptoms during life of cord-disease. In both cases extensive degeneration was found in the white matter of the cord, the gray matter

¹ Münch. med. Woch., Nov. 13, 1894.

² University Med. Mag., April, 1895.

³ Lancet, March 30, 1895.

being unaltered. Taylor thinks these changes due to sclerosis following hemorrhages, as well as to toxemia.

Bormann¹ details a case of pernicious anemia in which the signs of disease of the spinal cord gradually developed. The latter were of the type of a disseminated sclerosis, in which, however, alterations in the speech, nystagmus, and intention-tremor were absent. The case lasted a year and nine months, and was marked by a period of three months during which the anemia and the spinal symptoms improved. After death there was found degeneration of the columns of Goll, of the pyramidal tracts, and of the anterolateral parts of the cord. He notes that similar changes may occur independent of anemia, but that in pernicious anemia they are directly dependent upon the latter for their existence.

Askanazy² has made some interesting observations on the blood of a case of rapidly fatal pernicious anemia. Many of the red corpuscles were found to be altered in their manner of taking up stains, some becoming red or yellowish-red with Ehrlich's mixture, or violet with a mixture of hematoxylin and eosin. There was a great number of nucleated red corpuscles, of which some had multiple nuclei, or even complete resolution of the nuclei into granular matter (karyolysis). Karyokinesis was also noted in the red cells, and was followed through its various stages in one corpuscle of a specimen of fresh blood.

Stuhlen³ details some investigations regarding the occurrence of iron pigment in various organs in anemia. In most cases of severe anemia, particularly in pernicious anemia, there is a deposit of iron in the liver and spleen, and frequently also in the kidneys. The bone-marrow contains abundant pigment-granules in some cases, but in others none at all. In severe anemias resulting from loss of blood and the like there is no deposit of iron at all or only the faintest traces. In the presence of marked deposits, of iron or in the complete absence of this, some conclusion may be reached as to the cause and mode of origin of the anemia.

Treatment.—[The most important addition to the treatment is bone-marrow. The reports regarding this are widely varying, though a number of writers report excellent results. The whole matter, however, must be considered unsettled.] Frazer⁴ records a case of extreme anemia with pronounced symptoms in which the administration of uncooked ox-bone marrow in quantities of 3 ounces daily by the mouth caused decided improvement after twenty-seven days. The blood before and after the treatment showed respectively 1,860,000 red corpuscles with 30 per cent. of hemoglobin, and 3,900,000 red corpuscles with 78 per cent. of hemoglobin. Danforth⁵ had excellent results from the use of bone-marrow in a case of extreme anemia in which the stomach was almost wholly unretentive of food or medicine. He used at first marrow of ox-femur; later a glycerin extract of calves'

¹ Brain, 1894, No. 66.

² Zeitsch. f. klin. Med., xxii.

³ Deutsch. Archiv f. klin. Med., April, 1895.

⁴ Brit. Med. Jour., 1894, p. 1172.

⁵ Chicago Clin. Rev., Oct., 1894.

ribs, with arsenic, and rendered palatable by addition of an acid phosphate. Drummond¹ records an instance of pernicious anemia in which the ingestion of raw bone-marrow was followed by decided improvement in the condition of the blood and in the general state of the patient. Finally, however, the patient died of edema of the lungs. Barrs² reports a case treated with arsenic in which the drug produced no marked improvement, but led to a widespread multiple neuritis. Subsequently the patient was treated with bone-marrow, and under this treatment the blood became entirely normal. The neuritis to a certain extent persisted. J. S. Billings, Jr.,³ has used the extract of bone-marrow in the treatment of various forms of anemia. The preparation used was a glycerin extract of sheep's ribs, the dose a drachm a day. Two cases of chlorosis improved, but in 2 of pernicious anemia it failed absolutely. He insists that the use of bone-marrow is not analogous to that of thyroid gland and extract, inasmuch as the latter contain products of glandular activity. With regard to the success of the treatment in chlorosis, he thinks that the iron contained in the bone-marrow was the efficient agent, and he points out that in most of the reported cases of success in pernicious anemia arsenic was given simultaneously. [The conflicting reports regarding bone-marrow may be due to the preparations used. We ourselves treated a case with a glycerin extract without success, in which later the administration of raw ox-bone marrow was followed by such immediate improvement that we could not well avoid the belief that the remedy had produced the result.]

Russell⁴ records a case of pernicious anemia in which liquor arsenicalis was pushed to the point of tolerance and continued for five months. The ammoniocitrate of iron was used at the same time, but had little influence in producing the improvement. A year after the onset the patient seemed entirely well.

LEUKEMIA.

Etiology.—Ebstein⁵ contributes an exhaustive paper upon the relation of traumatism to leukemia, and records 2 cases very fully, alluding also to 2 others briefly. In the first case a patient had received injuries in a railroad accident. Some months later he was admitted to the hospital suffering with neurasthenia. He recovered sufficiently to resume work for a time, but three years later was again admitted with the symptoms of leukemia. The blood had not been examined at the time of his first admission to the hospital. In the second fully detailed case a patient, whom the author had not seen in person, had received an injury to the foot. Several weeks later enlargement of the inguinal glands occurred, and a high grade of leukemia was said to have been observed four and a half months later. This ran an acute course, and the patient died after a month and a half, having suffered

¹ Brit. Med. Jour., May 18, 1895.

² Ibid., Feb. 16, 1895.

³ Bull. John Hopkins Hospital, Nov., 1894.

⁴ Brit. Med. Jour., 1894, No. 1728.

⁵ Deutsch. med. Woch., July 19, 1894.

symptoms of an hemorrhagic diathesis and severe nervous disturbance. In this case no more minute observation regarding the blood was made than that there was an enormous number of white corpuscles. [In regard to the first case recorded we incline to the view alluded to by Ebstein, that the leukemic condition might properly be regarded as a consequence of the neurasthenic state following the accident, particularly as nervous impressions have been undoubtedly shown to bear relation to this as well as certain other blood-diseases. Regarding the second case there is much doubt; the diagnosis in this can scarcely be said to have been established, as careful blood-examinations were not made. In addition there were conditions that might conceivably have occasioned a high grade of leukocytosis—the local injury of the foot and the glandular enlargement in the groin. At all events, the case is not sufficiently clear to have weight in the solution of the question under discussion.]

Grazini¹ records a case of leukemia in a sailor of forty-two years in which the disease followed immediately after a severe abdominal contusion.

Vehsemeyer² in a discussion of the causation of leukemia points out that there is evidence that disturbance of the digestive organs is of great importance in this disease. He believes that the failure on the part of these organs to convert peptones into their ultimate products is the important causal factor in leukemia. In experimental work upon young dogs he was able to produce a progressive and high-grade leukocytosis by injection of solutions of peptone. The failure of Löwit to obtain similar results he asserts was due to the fact that this author used animals not suited for the purpose.

Vedrelli³ has collected 26 cases of leukemia and pseudoleukemia in whom, with more or less likelihood, microorganisms have been associated in an etiologic sense. In 10 cases bacilli were isolated, in 8 staphylococci, in 3 streptococci, in 1 the pneumococcus, and in 4 doubtful organisms. The author then describes 3 personal observations—2 of pseudoleukemia and 1 of leukemia—in which there were constantly found during life and after death staphylococcus pyogenes aureus and albus in the blood and lymphatic system. Subcutaneous transplantation of pieces of the diseased lymphatic glands in animals caused enlargement of the lymph-glands, spleen, and liver, and other changes, and the author was even inclined to note diminution of the hemoglobin of the blood. [Without questioning the accuracy of the bacteriologic investigations referred to and reported by the author, we must allude to the fact that terminal septicemia is very common in cases of chronic disease, and seems to be overlooked or to be unrecognized by some investigators.]

Symptoms.—Hintze⁴ reports as an instance of acute leukemia the case of a boy of sixteen years who suffered sudden rheumatic pains in the ankles, followed by rise of temperature, tenderness and enlargement of the spleen,

¹ Riforma Med., 1895, Nos. 75 and 56.

² Wien. med. Woch., Feb. 2, 1895.

³ Arch. Ital. di. Clin. Med., anno xxxii. punt. iv.

⁴ Deutsch. Archiv f. klin. Med., Bd. liii. Heft 3 und 4.

and an eruption resembling erythema nodosum on the legs. Later the liver and lymphatic glands enlarged, the eruption on the legs became surrounded by considerable infiltration, and the examination of the blood revealed a high grade of leukocytosis, in which leukocytes, with large round nuclei almost filling the cell, predominated. There were present in the blood numerous micrococci having some resemblance in their grouping to streptococci and to staphylococci. Finally, the spleen and liver decreased in size, though crops of eruption continued to appear; the ankle-joints and elbow-joints became enlarged and tender; effusion took place in the right pleural cavity; and soon the patient died. Postmortem, universal enlargement of the lymphatic glands was observed, and the spleen contained an area of infiltration. There were two small abscesses in the lower lobe of the left lung, and considerable serous effusion in the pleural and pericardial sacs. The various organs contained micrococci like those in the blood.

A. Fränkel¹ reports that he has seen 10 cases of acute leukemia—1 some time since, and 9 within a recent period. The latter have been carefully studied by the newer methods of blood-examination. Four of his cases occurred in young persons; 6 in adults. The prognosis is always bad, and the duration varies from two weeks to four months. The onset is acute and vehement. Petechial hemorrhages, hemorrhages in the retina, swelling of the glands, enlargement of the spleen, and a characteristic alteration of the blood are notable symptoms. Regarding the blood, he finds that it differs both from chronic leukemia and from that of leukocytosis. The increased number of mononuclear elements is the notable characteristic, and it may further be remarked that these corpuscles differ more widely in size than is the case in health or in chronic leukemia. Myelocytes, eosinophilous cells, and the corpuscles showing karyokinesis are all less abundant than in chronic leukemia. The multinuclear elements are increased, not only relatively, but absolutely as well. Regarding the nature of the condition, he believes that it is undoubtedly a form of infectious disease, though the absolute proof of this is wanting.

Cabot² remarks that many of the cases of acute leukemia, so called, are open to serious question as to the real nature of the disease-process, and very justly remarks that the points necessary to make this diagnosis should be: 1. The determination of a previously normal condition of the blood. 2. The presence in the blood of such numbers and varieties of leukocytes as occur only in leukemia. 3. A reasonably short course of the symptoms. On the negative side he remarks that mere increase in the number of white cells does not constitute leukemia, even though the spleen and lymphatic glands be enlarged; that acute onset of severe symptoms does not always indicate the beginning of a case of leukemia, for such sudden outbursts are often seen in the course of chronic leukemia; and, further, that there are no postmortem appearances or signs outside the blood-examination peculiar to leukemia either acute or chronic. With these thoughts

¹ *Centralbl. f. Innere Med.*, June 22, 1895.

² *Boston Med. and Surg. Jour.*, Nov. 22, 1894.

in mind he has tabulated and studied the 34 cases reported in literature, and finds that but 3, that of Senator and the 2 of Obrastow, are unquestionably instances of true acute leukemia. Many of the others may be such, but the evidence is not conclusive,

Richter¹ has investigated the question of the excretion of uric acid in cases of leukocytosis in infectious and other diseases, and finds that the theory of Horbaczewski, that there is an excess of this substance indicative of increased destruction of leukocytes, is not borne out. He points out that in some individuals there is a high percentage of uric acid under ordinary conditions, which at first may lead to erroneous results; that it is difficult to determine when the dissolution of the corpuscles begins and its extent; and, finally, it is not possible to assert the amount of uric-acid formation by the quantity in the urine. Askanazy² contributes an interesting paper on the relations of ulcerations of the digestive tract to leukemia. The case which formed the basis for his study was previously reported by Hilbert.³ A woman of thirty-seven years became ill in the eighth month of pregnancy. Headache, weakness, mild fever, and diarrhea were noted; then swelling, and finally ulceration, of the gums. There was no enlargement of spleen or liver, but some enlarged glands in the neck. Premature discharge of a macerated fetus and death occurred about eight weeks after the first symptoms. The ulcers in the mouth led to a suspicion of leukemia, which examination of the blood confirmed. At autopsy the lesions were mainly found in the bone-marrow and the digestive tract. The swellings of the mucosa of the mouth, and similar ones in the large intestine, were lymphomatous in nature, and showed some superficial ulceration. The infant and placenta were unaffected.

Treatment.—Rummo⁴ recommends hypodermic injections of arsenic in leukemia and pseudoleukemia: Fowler's solution is painful, but he has used a solution of arsenite of soda (2 grains to the ounce), in doses of $\frac{1}{2}$ to $\frac{1}{2}$ a grain, with excellent effect. Great care must be had to detect the first indications of toxic action.

It seems doubtful if bone-marrow could exercise any decidedly beneficial influence in leukemia, but Bigger⁵ reports a case of splenic enlargement and anemia (considered leukemia) in a lad of twelve, in which the administration of raw bone-marrow was attended with marvellously happy results. In a month's time the boy was better than he had ever been, and the spleen had become greatly reduced in size.

HODGKIN'S DISEASE.

W. A. Cross⁶ records a most interesting case of Hodgkin's disease in which some of the features of acromegaly and myxedema occurred intercur-

¹ Zeit. für klin. Med., xxvii. H. 3 and 4.

² Archiv f. Path. Anat. u. Phys., vol. 137, No. 1, p. 1.

³ Deutsch. med. Woch., No. 36, 1893.

⁵ Lancet, Sept. 22, 1894.

⁴ Rif. Med., 1894, No. 1894.

⁶ Med. Record, Sept. 1, 1894.

rently. A woman aged thirty-four years first suffered with a cough, which became of spasmodic character, and lasted for a year without other symptoms; then cachexia developed; and a mass to the right of the sternum, swelling of one of the glands in the left side of the neck, and apparent subsidence of the thyroid gland followed. With these changes came the characteristic features of myxedema and some of the appearances of acromegaly—clubbing of the fingers, curvature of the finger-nails, apparent projection of the os calcaneum, and a swollen welt on the outer side of the foot. General lymphatic enlargements progressed. Thyroid extract had a decidedly beneficial influence, but afterward failed, and weakness, stupidity, hallucinations, dyspnea, and palpitations grew marked toward the end. Drs. J. C. Wilson and Wharton Sinkler concurred in believing the case one of Hodgkin's disease in which the myxedema was due to lymphomatous involvement of the thyroid gland.

Kissel¹ records 3 cases of pseudoleukemia in young children, four, five, and eleven years, respectively, in age. The symptoms presented were periodical elevations of the temperature, with intervals of apyrexia, enlargement of the spleen and the cervical glands, and anemia, without increase of the white corpuscles. He remarks further that leukemia may have its onset as Hodgkin's disease.

Nammack² reports a case of Hodgkin's disease in a man twenty years of age, resulting fatally in seven months.

Fischl³ points out that the diagnosis of the infantile pseudoleukemia of Jaksch is not so easy as is often believed, and cites a case in point. The child was about a year old, very pale, rachitic, and had enlargement of the spleen and liver. The former organ was very large, the latter only slightly so. The blood contained 2,300,000 red corpuscles and 250,000 leukocytes—a proportion of 1 to 9. The stained blood showed preponderance of the large mononuclear forms, poikilocytosis, and abundant normoblasts showing mitosis. The very marked leukocytosis makes the diagnosis, whether leukemia or Jaksch's disease, very difficult, and he concludes that autopsy alone could settle it absolutely.

ADDISON'S DISEASE.

Etiology.—Auld⁴ has contributed an interesting study of the structure of the suprarenal gland, with deductions regarding the pathogenesis of Addison's disease. He calls attention in particular to the extremely vascular character of the inner cortical layer of the gland, and to the pigmented cells that abound within the capillary network. These cells seem to attract and destroy certain of the red corpuscles. After the effete corpuscles are thus removed the blood would seem to pass to the medulla for further purification. Viewing the adrenals as depurative in function, Addison's disease may

¹ Vratich, June 9 and 16, 1894.

² Med. Record, Mar. 16, 1895.

³ Prag. med. Woch., xix., 1894, p. 3.

⁴ Brit. Med. Jour., 1894, p. 1017.

be regarded as the result of systemic intoxication, and the characteristic pigmentation as the result of circulation and deposition of blood-pigment.

Maragliano¹ records an interesting case of Addison's disease, making it the basis of certain experimental studies. An interesting point developed was the fact that the urotoxic coefficient was greatly diminished, the quantity of urine required to kill a rabbit of 1 kg. being 53.20 c.cm. In regard to the lesions of the disease, he remarks that in 88 per cent. alterations are found in the suprarenal bodies, but he calls attention also to the fact that there are cases in which disease of these bodies occurs without the typical symptoms of Addison's disease, particularly noting the absence of pigmentation. He holds, however, that there are other diseases in which a certain symptom may be absent that is usually typical, and suggests that in the cases alluded to death occurs too soon for the development of the symptom in question.

Symptoms.—Coleman² reports a case of tuberculosis of the suprarenal bodies without bronzing of the skin, which occurred in a sailor of thirty-six years who died without assignable cause three weeks after coming under observation. There was marked asthenia and constipation. The temperature was never above 101° F. The reflexes were exaggerated and sensation delayed; during the last few days delirium supervened. Tuberculous disease of both lungs was discovered postmortem. The bronchial glands were cheesy and enlarged, and both adrenal bodies were diseased, tubercle bacilli being found in sections.

A case of Addison's disease reported by Dyson³ is interesting mainly on account of the rapid course, the fatal end occurring within half a year of the first symptoms. The same thing may be said of Donkin's case,⁴ in which the duration was but seven weeks, and of Star's,⁵ in which sudden death occurred three months after the onset.

Posselt⁶ reports 5 cases of Addison's disease in which autopsies were performed. In 4 tuberculous changes were found, and in 1 the interesting discovery of cancerous degeneration of the left suprarenal in combination with the left-sided cancer of the lung. A constant symptom in these cases was the bronzing of the skin, and pain was quite regular. In the case of cancer the latter was unilateral. In 3 of the cases psychical disturbances were noted.

Esslinger⁷ in a study of the tumors of the suprarenal capsules reported in literature, and from his own case of sarcoma of this organ, concludes that there are no clinical features by which the diagnosis can be made. The pain in the side, the subnormal temperature, the bronzing of the skin, the displacement of neighboring organs,—none of these is constant or ever of great diagnostic value. Diagnosis by exclusion is of little value, since tumors of

¹ *Riforma Med.*, No. 280, 1894.

² *Med. Rec.*, p. 552, 1895.

³ *Med. Jour.*, Nov. 3, 1894.

⁴ *Lancet*, Feb. 2, 1895.

⁵ *Ibid.*

⁶ *Wien. klin. Woch.*, No. xxxiv. et seq., 1894.

⁷ *Inaug. Diss.*, Leonberg, 1894.

the lymphatic glands also do not cause symptoms, and the same may be said of many renal tumors.

Treatment.—Sacaze¹ reports the case of a young man who had acquired syphilis, and six months later developed the symptoms of Addison's disease. The first trial of specific treatment failed entirely; a second was somewhat more successful, but the disease relapsed and the man died. No autopsy was performed.

Maragliano² has found injections of a glycerin extract of suprarenal bodies efficacious, contrary to the experience of Foà and Zuco, the latter of whom first suggested this treatment, using watery extracts, however.

PURPURA AND HEMOPHILIA.

Lebreton³ records the case of a patient who, forty-eight hours after violent emotion, had intense headache and backache, chills, fever, and repeated epistaxis. Twelve hours later there appeared purpuric spots of confluent character, so that scarcely any unaffected area was seen on the hands, arms, or thighs. On the body, however, the spots were discrete. The spleen was enlarged, the skin cold, the condition apparently serious. Cultures from the urine and blood, made with precaution, disclosed the staphylococcus pyogenes albus. The portal of entry and the source of infection could not be determined. Mathieu in discussion pointed out that such cases in the absence of bacteriologic examination would pass as instances of neuropathic purpura.

Olivier⁴ reports an interesting case of hemophilia beginning at the onset of menstruation. The first menstrual flow began as a slight hemorrhage, but soon became so severe as to threaten life. It was learned that in childhood she had fallen, injuring the head, and a large ecchymosis had formed beneath the scalp; also it was learned that the removal of teeth at various times had been followed by considerable bleeding.

DISEASES OF THE SPLEEN.

Attilio⁵ reports a case of abscess of the spleen occurring in a woman of sixty years who had previously suffered with no definite illness, and in whom none of the ordinary etiologic factors of this condition were present.

Subbatic⁶ records a case in which, following severe attacks of intermittent fever, there was developed a tumor of increasing size under the left ribs. Peritonitis and traumatism had not been present. The tumor reached the size of a man's head, was oblong, fixed in position, fluctuating, and continuous in its percussion-dulness with the spleen. Operation was resorted to, and a blood-cyst with a smooth wall was discovered around the spleen. The author considers it as an instance of purely perisplenic cyst not dependent upon disease of the spleen itself.

¹ Gaz. des Hôpitaux, No. 7, 1895.

² Loc. cit. supra.

³ La Méd. moderne, No. 8, p. 126, 1894.

⁴ Jour. de Méd. de Paris, No. 31, p. 379.

⁵ Internat. klin. Rundschau, J. viii., No. 47.

⁶ Wien. med. Presse, No. 36, 1894.

DISEASES OF THE THYROID GLAND.

Thyroiditis.—Jeanselme¹ contributes a comprehensive study of infectious thyroiditis and strumitis. Middle age and female sex predispose to these affections, and they are very common in the puerperium and after traumatism or in cases in which venous stasis has occurred. Moreover, an enlarged thyroid is especially liable to infectious troubles. The immediate cause of thyroiditis is bacterial infection. It is found frequently in the convalescence of typhoid fever, in which the typhoid bacillus and staphylococci occur; also in conjunction with gastrointestinal troubles, with bronchitis, influenza, pneumonia, and various other infections. In puerperal cases streptococci are most commonly found. Anatomically, there is a tendency to the formation of multiple abscesses in the gland, and sometimes to the occurrence of gangrene. Rapid enlargement of one side of the gland, with disturbance of swallowing, speech, and pain on movement of the neck, are early symptoms. Compression of the veins and nerves of the neck may be considerable and serious. Fever is always present. The termination is in resolution, sometimes with induration, or more rarely in abscess or in gangrene. The diagnosis from simple congestion of the thyroid, acute exophthalmic goiter, hemorrhagic goiter, and other thyroid affections is easily made by the presence of the fever, pain, and other signs of inflammation.

Mygind² has also contributed an interesting paper on acute thyroiditis, of which he distinguishes a suppurative and a simple form. Of the latter he has collected 17 undoubted cases ending in resolution, and adds 1 observed by himself. The disease is more common in females and between the ages of twenty and thirty years. No distinct causes are discoverable; the onset is abrupt, and there is early vague pain in the neck. After a day or two the thyroid enlarges to the size of a hen's egg or to a greater size. The swelling and symptoms subside about the third day, and often very abruptly. Pressure-symptoms, such as dyspnea, dysphagia, hoarseness, or cyanosis, are sometimes observed, and fever is more or less marked in all cases. The suppurative form occurs in septic diseases, such as puerperal fever, and is usually distinguished by the character of the fever and the general symptoms, together with local signs of suppuration. The prognosis in the simple form is absolutely favorable, and rarely is any lasting infiltration of the gland left after the attack.

Lion and Bensaud³ report a case of pneumonia in which, after a slow convalescence had been established, there occurred sudden pain, tenderness, and swelling in the neck. The temperature rose to 102.9° F., and an abscess developed in the left lobe of the thyroid gland. This was found to contain a pure culture of pneumococci.

Treatment of Goiter.—Reinhold⁴ found in 6 cases of insanity with enlarge-

¹ *Gaz. des Hôpitaux*, No. 15, 1895.

² *Jour. of Laryngol.*, March, 1895.

³ *Bull. de la Soc. anat. de Paris*, June, 1894.

⁴ *Münch. med. Woch.*, July 31, 1894.

ment (goiter) of the thyroid gland that administration of fresh thyroid gland exercised a definite influence on the size of the gland. In 5 of parenchymatous goiter great reduction or complete disappearance of the goiter occurred, while in the one unsuccessful case the disease was cystic in nature. He used fresh calf's thyroid, and administered it at intervals of from ten to fourteen days. None of the unpleasant effects sometimes noted were observed—a fact which is likely the result of the intervals allowed to elapse between the administrations.

Mikulicz¹ has found that thymus gland is equally efficacious with thyroid gland in the treatment of goiter. He has himself employed it in 11 cases—10 of simple goiter and 1 of Graves's disease. He uses the raw sheep's thymus, of which 10 or 15 g., finely cut up on toast, was the dose used at the commencement. Subsequently as much as 25 g. could be taken. The remedy was given thrice weekly, and of the 10 cases of goiter 1 was rapidly cured, 6 improved decidedly, 2 slightly, while 1 remained unaffected. In a woman with Graves's disease there was notable improvement in the subjective symptoms and diminution in the protrusion of the eyes and tachycardia, but the goiter and tremor remained the same.

Sievekings² records a case of sarcoma of the thyroid gland with diffuse sarcomatosis. The patient was a man aged forty-two, who during the last three months began to suffer with nausea, pains in the abdomen, and general weakness. Later an enlargement of the thyroid gland was discovered. This was uniform and of stony hardness. The abdomen became swollen, especially in the region of the stomach. Ascites developed, and the liver was very much enlarged and irregular on the surface. After death the thyroid gland was found the seat of a uniform round-celled sarcoma, and the liver contained numerous secondary nodules. The case is of interest in that round-celled sarcoma is comparatively rare, and still more unusual is the uniform involvement of all parts of the gland. The author was able to find but 3 similar cases reported.

DISEASES OF THE BRONCHI, LUNGS, AND PLEURA.

DISEASES OF THE BRONCHI.

Koch³ describes two cases of chronic fibrinous bronchitis. The points of interest brought out by these cases are that both were women, and that there was no tuberculosis in either. In both cases the condition was unilateral and occupied but a part of the affected lung. The casts of the bronchi were solid in the case of the smaller tubes, and hollow when they came from the large bronchi. The clinical course was the same as in previously-reported cases.

¹ Berlin. klin. Woch., April 22, 1895.

² Centralbl. f. Innere Med., Dec. 29, 1894.

³ Wien. med. Woch., March 9, 1895.

Bensaund¹ presented at the Paris Anatomical Society an interesting specimen of dilatation of a bronchus at the right apex. The patient, a woman of fifty-eight years, had been ill three months with cough, dyspnea, hemop-

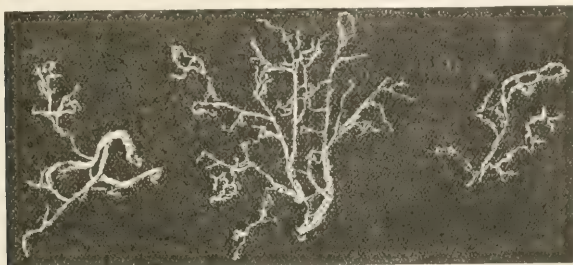


FIG. 5.—Bronchitis fibrinosa chronica essentialis; hardened in alcohol and accidentally broken into three portions (P. Koch, Wien. med. Woch., March 9, 1895).

tysis, and signs of induration at the apex. Death was sudden, and the condition indicated was found. No tubercles, but enormous numbers of capillaries were found on microscopic examination of the walls of the dilated tube.

EMPHYSEMA AND ASTHMA.

Griesinger pointed out many years ago that acute emphysema of the lungs may occur during paroxysms of fright in the insane. Ziertmann² refers to this as the only reference in literature, and reports 5 cases under his own observation. He found that the pulmonary condition followed very soon after the beginning of the mental disturbance, reached its height when this was most decided, and declined coincidently with it. The cause of the pulmonary distention he regards as an irritation of the vagus-center, either directly or in consequence of vasomotor disturbances leading to effusion into the ventricles.

Swerschewski³ in studying a case of bronchial asthma found that the number of eosinophile corpuscles increased from the normal of from 1 to 8 per cent. (according to different authors) to from 2.9 to 15.9 per cent. of the entire number of leukocytes. Immediately before the attacks of asthma there was an increase; immediately after the attacks, a lessening of this form of leukocytes. The same was true of the lymphocytes, but the neutrophile cells were decreased before and increased after the paroxysm.

Blair⁴ very properly points to the fallacy in treating reflex asthma by directing attention only to the local nasal condition, and, moreover, he deprecates any radical destruction of areas of mucous membrane. Soothing oily sprays, suitably medicated, continued for a long time, together with consti-

¹ Bull. méd., Aug. 5, 1894.

² Münch. med. Woch., Sept. 18, 1894.

³ Centralbl. f. Innere Med., Feb. 16, 1895.

⁴ Med. Rec., Aug. 18, 1894.

tutional remedies and regimen to improve the general condition of the nervous system, constitute the proper treatment. Skerrit¹ finds that caffein is a valuable remedy in bronchial asthma and in bronchitis with a tendency to spasm of the tubes. During the paroxysms he uses 5 gr. of the citrate of caffein every four hours till relief follows. In cases in which regular attacks occur in the early morning he gives from 5 to 10 gr. at bedtime, and finds that no harm results from long continuance of such treatment, and that sleep is not much interfered with.

PNEUMONIA.

[There is little doubt but that pneumonia in many instances is infectious and contagious. There remain, however, a certain number of doubtful cases which make it questionable whether this is always the case or not.] Thornton² reports a house-epidemic of pneumonia, 3 cases occurring within two weeks, of which 2 died. The first was a young man; the other two, his mother and sister, who nursed him. Nothing was found to account for this infectiousness, excepting possibly bad sanitation. There was no indication of influenza. Daly³ observed an interesting house-epidemic in which the first case, a man of sixty-three years, presenting the typical signs of fibrinous pneumonia, was followed in forty-eight hours by the second, the wife, and in two days by the third, the attending physician. The 3 cases presented similar clinical features, and all ended fatally. In a previous local epidemic under his observation 6 persons had been attacked, and 2 died.

Talamon⁴ records several striking cases which confirm the prevailing view that pneumonia is contagious. A father and son who had nursed the mother were taken with severe pneumonia the day following the mother's death. An old hemiplegic was seized three days after a case of pneumonia was placed in the adjoining bed in the hospital ward. A woman entered the hospital with severe pneumonia contracted while nursing a case of that disease. In connection with such instances of contagion it is noticeable that they are specially serious in prognosis.

Symptoms.—Wells⁵ contributes a very elaborate paper on croupous pneumonia based upon the literature of the disease and his own experience. The paper is an interesting and comprehensive statistical resume of the symptomatology of the disease, and will prove useful for reference. Percy Kidd⁶ in a study of the number of leukocytes occurring in the blood in pneumonia found among 48 patients the number 6000, the lowest reading, twice, and in 5 other cases it was below 14,000, or double the normal; in 25 it was between two and five times the normal number; in 11 between five and seven times the normal; and in 5 cases the number was 50,000 or more—once being 100,000. He denies any prognostic value to leukocytosis or

¹ Practitioner, April, 1895.

² Lancet, Aug. 11, 1894.

³ Jour. Am. Med. Assoc., May 26, 1894.

⁴ Brit. Med. Jour., July 2, 1894.

⁵ Méd. moderne, Mar. 20, 1895.

⁶ The Practitioner, Sept., 1894.

its absence. The most particularly virulent of his cases was one in which the number was 100,000.

Bieganski¹ has studied the blood in 13 cases of croupous pneumonia. Of these 13, 11 ended in complete resolution and 2 died. In the 11 named there was decided leukocytosis, while in the 2 fatal cases this did not occur. The leukocytosis begins early (1 examined eighteen hours after the chill had already developed it) and continues, increasing somewhat, until the crisis, when there is a rapid decrease. In cases in which pseudocrisis occurs no decrease of the leukocytosis takes place. Regarding the individual leukocytes, he found the polynuclear elements decidedly increased, whereas the large and small lymphocytes, and particularly the latter, were comparatively decreased. In none of the 11 cases did he find a single eosinophile leukocyte during the period of leukocytosis. After the crisis the polynuclear cells decrease greatly in number and the lymphocytes increase, while the eosinophile cells found constitute from 2 to 4 per cent. of all the white corpuseles. The blood-plaques are greatly decreased before and increased after the decline of the fever. [Other observers also have found leukocytosis an almost constant symptom of croupous pneumonia, especially of the favorable cases. Reference has been made to these reports in the section on Diseases of the Blood.]

Seuberlich² calls attention to the pains accompanying the early stages of croupous pneumonia, and discusses their causation, alluding particularly to the facts that would seem to indicate their neuralgic origin. In addition he reports 5 interesting cases in which unmistakable neuralgic affections occurred. In 2 there was decided trigeminal neuralgia preceding (in 1 by five days) the real onset of the pneumonia; in a third there was intercostal neuralgia on the side opposite the lung-involvement, which disappeared under the use of antipyrin at the same time that the ordinary local pain became noticeable; in a fourth the neuralgia took the form of sciatica; while in the fifth the lumbar region and the left forearm (the pneumonia was left-sided) were affected. Hood³ mentions, as some of the unusual symptoms that may accompany acute pneumonia, profuse hemoptysis, meningeal symptoms, and the general conditions giving a resemblance to typhoid fever. The crisis may be prevented by a complication, such as bronchitis, pericarditis, or pleural effusion. Talamon⁴ has found that herpes occurs at all stages of pneumonia, and is dependent rather upon the peculiar liability of the individual to herpes than upon the nature of the case. It does seem, however, that prognosis is better in cases in which the eruption occurs.

Looking upon pneumonia as a pneumococcus infection, the following is of interest: Foxwell⁵ defines catarrhal fever or catarrhus to be an acute specific disorder of a week's duration; occurring with or without fever; characterized pathologically by an exudation—serous, fibrinous, cellular, or

¹ Deutsch. Archiv f. klin. Med., Sept., 1894.

² "Ueber Neuralgien bei croupöser Pneumonie," Inaug. Diss., Jena, 1894.

³ Lancet, Aug. 18, 1894. ⁴ Rif. Med., Mar. 20, 1895. ⁵ Lancet, June 15, 1895.

membranous—from one or more of the lining membranes of the body; with, in some cases, acute glandular inflammation; caused by a microorganism, probably the pneumococcus of Friedländer; and mildly contagious. [This microorganism is recognized as of little importance in pneumonia, but its relations to certain cases remain to be determined.]

Complications.—Galliard,¹ in discussing the question of bilious pneumonia, denies that this is due to catarrh of the duodenum or bile-duets, but regards it as the result of an invasion of the liver with pneumococci. He bases this view upon the repeated discovery of these organisms in the liver in such cases. In regard to treatment he would use some emetic and laxative at first, and later salicylates.

Pryor² believes that pneumonia of the aged is overlooked in many quarters. American statistics show it to be the commonest cause of death in old persons. The clinical course is often most deceptive, chill, pain, dyspnea, cough and expectoration, dulness and other physical signs, all may be absent or so ill defined as to escape notice. Elevation of the temperature (determined in the rectum) is the most constant symptom. The disease frequently affects the apex, and is not rarely tuberculous in nature.

Silvestri³ records a case from the clinic of Bozzolo of pneumonic consolidation of the lungs occurring in a tuberculous patient in which signs of meningitis developed and were followed by right hemiplegia. The autopsy showed neither meningitis, thrombosis, embolism, nor hemorrhage. Bozzolo remarks that in such cases the theory that the toxins are responsible is not entirely warranted. He inclines rather to the view of Lepine, who ascribes such cases to circulatory derangements. In the case in question localized edema of the brain was found in the region of Rolando's fissure on the left side. Boysson⁴ records an analogous case in a woman of seventy-seven years in which there was an attack of aphasia, with paresis of the right half of the face and twitching of the right arm following an attack of unconsciousness. The symptoms subsided after twenty-four hours, and the author ascribes them to a temporary vasomotor disturbance in the cortex, calling attention to the usual short duration and favorable outcome of such attacks.

Meunier⁵ notes a case of suppurative arthritis occurring in the course of acute pneumonia. The liquid obtained by aspiration contained both pneumococci and streptococci. Prioleau⁶ details another in which three days after the termination of an attack of croupous pneumonia the patient developed an abscess of the testicle in the pus of which diplococci were discovered. After an interval of a month there was a second attack of pneumonia.

Rivalta⁷ found acute edema of the lung in 33 of 51 fatal cases of pneumonia; that is, it occurred in 65 per cent. of the cases. In 52 per cent. it was the cause of the fatal termination. This edema is acute inflammatory

¹ Méd. moderne, No. 34, 1894.

² Med. News, June 2, 1894.

³ Riforma Med., No. 15, 1895.

⁴ Thèse de Paris, 1894, G. Steinheil.

⁵ Arch. gén. de Méd., Nov., 1894.

⁶ Le Mercredi méd., No. 36, 1894.

⁷ Wiener med. Presse, No. 28, 1894.

in nature, and not a consequence of collateral hyperemia, as has often been said. The inflammatory nature is evidenced by the return of the exudation and the number of pneumococci present.

Reilly¹ reports a very interesting case in which three or four days after pneumonia in a girl of fifteen there was a curious attack of purpura and gangrene. After a preliminary period of unrest she suffered with sudden and violent pains in both legs and thighs; then in the toes and in the margins of both ears, also in the arms and shoulders. Within forty-eight hours the toes and fingers became much swollen, as well as the tip of the nose and the superior margins of both ears. The hands and feet, and to a less extent both cheeks, were covered with purpuric spots, which rapidly became black, shrivelled up, and desquamated. The same thing was seen on the tip of the nose and the margins of the ears. The toes and fingers, however, were very painful, blue-red in color, and icy cold; small seropurulent vesicles appeared, destroying the skin and laying the parts bare. Some of these areas were almost completely healed when the attack again returned, and this was repeated four or five times within three weeks. All the fingers recovered, but the last phalanx of the second and third toes mummified and fell off. In the course of two months she had practically recovered, and then regained complete health.

Treatment.—Robinson² contributes an interesting paper on the treatment of croupous pneumonia. The points requiring special attention are pyrexia and pulmonary congestion. Pyrexia is rarely to be treated with drugs, but a dose of phenacetin occasionally is the least likely to cause depression. He relies rather upon remedies, like spirit of Mindererus or potassium salts, which act upon the kidneys, skin, or bowels. The use of cold water externally, as usually employed, seems to him of little use, and cold bathing is capable of causing untoward results. When pyrexia and pulmonary congestion coexist, the most useful remedy is kermes mineral (oxysulfuret of antimony), which is well administered in doses of a thirtieth of a grain in a mixture of syrup of gum and orange-flower water every hour or two. Bloodletting is a treatment of the utmost value in the early stages, and may be followed by remedies to stimulate the heart. Of these the most useful are nitroglycerin, strychnin, caffein, and black coffee. Alcohol is useful as a heart-stimulant and as a general nutrient. He advises against the use of digitalis.

Andrew H. Smith³ inveighs against the forced feeding sometimes practised in acute pulmonary diseases, particularly in pneumonia. The added burden to the stomach, the heart, and the organs of elimination necessarily is disadvantageous. The quantity of food is to be regulated carefully by the power of assimilation, and this in turn depends largely on the functional efficiency of the lungs and the state of the blood. In pulmonary tuberculosis and other chronic lung-diseases the latter may be too poor to admit of

¹ N. Y. Med. Jour., June 2, 1894.

² Ibid., Aug. 26, 1894.

³ Internat. Med. Mag., Aug., 1894.

sufficient alimentation. In such cases he has found rectal enemata of defibrinated blood most useful.

Mays¹ again insists on the great value of ice-bags in the treatment of croupous pneumonia, asserting that it tends to lessen the congestion of the first stage, and eventually to cause absorption of the exudate after its formation. He advocates the use of the local application until the temperature falls. Among 74 cases collected by him in which this treatment was used, there were but 2 deaths, a mortality of but 2.7 per cent. Jackson² published in 1892 a series of 25 cases of pneumonia treated with external applications of ice, in which the success of this treatment seemed most satisfactory. But 1 of the cases died. He now details 17 additional cases without a single death. Stimulants, alkalies, and other remedies were used at the same time, but the author warns against opiates and the coal-tar remedies. Smith³ has treated 5 cases of acute pneumonia after the method of Fenwick, by "ice-cradling." All of these were instances of sthenic pneumonia in men ranging from thirty to forty years of age, and in each there was pleurisy; 1 was a case of double pneumonia. All recovered. There was no evidence of marked improvement following the establishment of the treatment, but the pyrexia, the heart, and the respiration all seemed to be kept in check by the lower temperature secured. It was found that the temperature of the air fell from 88° to 60° or 70° under the blankets. Rendu⁴ reports 2 cases of pneumonia treated successfully by cold water. In the first he used the wet sheet with kermes mineral. There was a diminution in the dyspnea, fever, and other symptoms, although the procedure did not cut the disease short or modify its usual course decidedly. In the second case the wet sheet was first used, but later cold baths, and also with apparent advantage.

Kerr⁵ claims that the objections urged against the use of digitalis in croupous pneumonia on the ground that it stimulates the right heart to an impossible task, that of pumping blood through a consolidated lung, are founded in half-knowledge of the conditions present in pneumonia. The heart-weakness is due to nerve-exhaustion from high temperature and to disease of the heart-muscles, as well as to mechanical causes. Digitalis is efficient in a double way: it not only stimulates the right heart, but also, by increasing the systolic power of the left ventricle, and thus increasing the negative pressure during diastole, gradually removes the blood from the engorged lungs to the peripheral circulation. In practice he claims the drug should not be given indiscriminately, but only when the character of the pulse shows failing systolic tonus. Bloch⁶ has treated 21 cases of catarrhal pneumonia in adults and 13 in young children, giving large doses of digitalis after the method of Petresco, and finds the result most favorable. The pulse becomes steadier and the temperature subsides a day or two before the real

¹ Med. News, Oct. 13, 1894.

² Brit. Med. Jour., May 11, 1894.

³ Jour. Am. Med. Assoc., July 28, 1894.

⁴ Therap. Gaz., Nov. 15, 1894.

⁵ Jour. de Praticiens, No. 37, p. 449, 1894.

⁶ Gaz. méd. de Liège, Oct., 1894.

crisis. Small doses apparently have no effect, but large quantities are decided in action. If after a day or two there is no improvement, the remedy should be suspended for a day and then renewed. The infusion should always be used, as it is less toxic than the leaves, which contain insoluble digitoxin. Strong infusion, however, should not be employed.

Moir¹ believes that the temperature in pneumonia is reduced within safe limits and the mortality lessened by giving calcium chlorid, from 60 to 90 grains in twenty-four hours.

Ferrara in a paper² on the pathogenesis and treatment of pneumonia reviews the current opinions regarding the etiology and nature of the disease, and outlines the systematic treatment as well as the recent attempts at specific serum-treatment. On the strength of his own experience, in conjunction with Prof. Semmola, he would condemn the method of Dieulafoy, Forbier, and Lepine of injection of turpentine for the purpose of producing abscesses, as unreliable and unsafe. In his own attempts the amount of turpentine injected did not cause abscess, and the quantity used by Lepine he believes might cause nephritis. The value of this treatment is claimed to consist in the production of an aseptic abscess which will collect or fix the morbid products from the blood and thus relieve the general system; hence they are called fixation-abscesses.

Hughes and Carter³ injected 14 cases of pneumonia with blood-serum taken from convalescent patients without observing any beneficial effects.

PULMONARY GANGRENE.

Rhymer⁴ records 3 cases of gangrene of the lung following influenza. In 1 of these cases the direct relation of the pulmonary affection to influenza was established. In the other 2 the patients came under observation at a later date, but the relation of the pulmonary disease then existing to a past influenza was hardly to be doubted. In each case pneumonic consolidation was followed by the gangrenous process. Fetid expectoration was present in 2, while the gangrenous nature of the disease was manifested in the third by the sudden occurrence of rupture and pyopneumothorax in a case of cortical pneumonia. [Cases of this nature are perhaps not uncommon, but there are comparatively few accurately detailed instances recorded in literature. Litten in the collective investigation of the Verein für Innere Med. refers to 6 instances, and a number of others have been observed. We have ourselves seen 2 not recorded as yet.]

Abelman⁵ records a case of influenza in a child of four years in which death occurred from the development of a gangrenous condition of the right lung, and remarks that this complication is a rare one in grippe at such an early age, though it occurs quite often in adults and old persons. It is not a primary condition, but succeeds upon grippal pneumonia.

¹ The Practitioner, No. 317, p. 343, 1894.

² Am. Med.-Surg. Bull., Aug. 1, 1894.

³ Therap. Gaz., June 15, 1894.

⁴ Münch. med. Woch., Feb. 26, 1895.

⁵ Vrach. Sept. 1, 1894.

SYMPTOMATIC PULMONARY CONDITIONS.

Hemoptysis.—Gluzinski¹ divides cases of hemoptysis into those entirely without significance; those marked cases in which death occurs within a few minutes or within a day or two; all remaining instances may be separated into several classes: 1. Those in which careful examination does not discover any disease of the lungs before or after the hemorrhage, and in which the patient recovers without fever or other untoward symptom; 2. Those in which there is a certain amount of dulness on percussion and weakness of the breath-sound after the hemorrhage, but in which rapid disappearance of these signs takes place; 3. Those in which more or less fever with increase of existing dulness on percussion occurs after the hemoptysis, and in which there may be irregular fever for a considerable length of time; 4. Those in which the local condition grows steadily worse; 5. The cases in which there is progressive increase and a development of the symptoms of phthisis florida. From an investigation on animals the author denies the assertion of others that healthy blood effused into the lung exercises no untoward effects. On the contrary, he finds by the end of twenty-four hours changes in the epithelium of the alveoli followed by slight peribronchitis. By the sixth day there is atelectasis and overgrowth of fibrous tissue in the affected area, and sometimes there is an actual desquamative pneumonia.

Cough.—Lavrand² calls attention to the fact that in many patients suffering with ear-disease cough is provoked by the pressure of a blunt instrument in the meatus. This reflex is due to the fact that the auricular branch of the vagus proceeds by the way of the jugular fossa and Fallopian canal to the posterior part of the external auditory meatus. Disease of the ear may occasion continued cough of a paroxysmal or an explosive, harsh character.

Diaphragm-phenomenon.—Martius³ calls attention to the diaphragm-phenomenon which was first accurately described by Litten, though it had been previously observed. This may be seen by placing the patient horizontally with the feet toward the window, and observing the lower part of the chest as the patient inspires and expires deeply. The horizontal line which represents the base of the diaphragm is then seen to move upward and downward. With ordinary expansion the lower portion of the lung is not inflated, and the diaphragmatic pleura remains in contact with the costal pleura. Deep inspirations extend this portion, separate the two pleural reflections, and cause downward flattening of the diaphragm. This expansion is observable in the transverse groove which is seen on the upper abdominal and lower thoracic wall. This sign is absent in emphysema of the lungs and in cases of pleural adhesion or exudation.

¹ Deutsch. Archiv f. klin. Medicin, April, 1895.

² Jour. des Sciences méd. de Lille, April 21, 1894.

³ Wien. med. Woch., March 2, 1895.

DISEASES OF THE PLEURA.

Serofibrinous Pleurisy.—At the Réunion général de Médecins suisses, recently held, Eichhorst¹ remarked that the relation between serous pleurisy and tuberculosis should not be overlooked, from the danger of subsequent tuberculosis of the lungs. The absence of tubercle bacilli on microscopic examination does not exclude tuberculosis. Experimental injection into animals is necessary. In a series of such experiments he injected 1 g. of the effusion into the peritoneal cavity of 11 guinea-pigs, only 1 of which became tuberculous. It occurred to him that the volume injected was insufficient, and he had constructed a syringe holding 15 g., by which his results were materially altered, 23 such injections resulting in 15 infections. Five of the patients whose pleuritic effusions were used and infected animals returned later on with tuberculosis. He concludes that two-thirds of the cases of serous pleurisy are tuberculous. By the same method he found that 8 of 27 cases of serous pericarditis were tubercular.

Fernet² has found, in the bacteriologic study of cases of serofibrinous pleurisy, pneumococci in 4 (20 per cent.); staphylococci in 6 (30 per cent.); Eberth's bacillus in 1 (5 per cent.); tubercle bacilli in 3 (15 per cent.); and undetermined organisms in 6 (30 per cent.). The pneumococcal cases are frank, sthenic, and benign in tendency. Those due to staphylococci are more insidious in onset and less frank in their symptomatology. The effusion contains less fibrin than in the first group, and is likely to recur after tapping, while that in the first class is not. The cases due to Eberth's bacillus occur in the course of typhoid fever, are latent in their symptomatology, and are often somewhat hemorrhagic. The tuberculous forms tend to be dry and fibrinous, but twice he found staphylococcus albus associated, and thinks associated cocci are usually the cause of any serous effusion in tuberculous cases. Netter very properly objected that tubercle bacilli may have existed in some of the cases in which Fernet did not find such, and insisted upon the necessity of inoculation to determine this point. Fiedler³ regards certain cases of pleurisy as distinctly rheumatic in nature. These are likely to involve the diaphragmatic pleura, are not markedly painful, the effusion is rapidly formed, a history of rheumatism, tonsillitis, erythema nodosum, chorea, or other rheumatic affections is obtained, and salicylates have a decided remedial effect even when effusion has already taken place. MacArtney⁴ considers simple pleurisy, with or without effusion, to be generally of rheumatic origin, and reports 44 cases treated with the salicylates with marked success.

Westbrook⁵ discusses the frequency with which pleuritic effusion occurs as a terminal symptom of pleuropneumonia.

Gerhardt⁶ calls attention to the features of interlobular pleurisy, and

¹ Univ. Med. Jour., June, 1895.

² La Tribune médicale, Feb. 27, 1895.

³ Festschrift gewidmet Theo. Thierfelder, Leipzig, 1895. ⁴ Med. Rec., Sept. 22, 1894.

⁵ Ibid., Mar. 9, 1895.

⁶ Berlin. klin. Woch., No. 33, 1894.

points out that the signs of this affection are fairly characteristic. After an onset marked by fever and pain there is discovered a strip of dulness extending from the third or fourth dorsal vertebra downward and outward to the lower border of the lung anteriorly. The evidences of the fluid character of this area of dulness are less clear than in the case of ordinary effusions. After a variable time the fever subsides, and soon a large quantity of offensive purulent liquid is expectorated. When a putrescent character of the liquid is noted there has probably been previous pulmonary trouble or rupture into the pleura of a diseased gland. In postmortem reports it is generally noted that the costal and visceral pleurae are united, so that it is not unlikely that there has been a previous general pleurisy followed by localization and suppuration. When rupture takes place through the bronchi, as in the cases of deep-seated interlobular pleurisy, the prognosis is quite favorable.

Jordan¹ has noticed in 19 cases of pleural effusion that the removal by aspiration of a single c.cm. influenced favorably the absorption of the fluid and caused increased excretion of urine. In 12 of the cases the disease was acute, in 2 it was chronic, and in 1 there was hemorrhagic effusion. The effect of this treatment is ascribed to traumatic irritation.

Kerr² records an interesting case of pulmonary hypertrophic osteoarthropathy in a man aged twenty-two years, and beginning six months after the onset of a pleurisy from which he recovered slowly. It began with aching pains and rapid enlargement of the wrists and ankles. There were slight dulness and weak breathing over the right base, and slight cough with morning expectoration free of tubercle bacilli. His general condition was good, the thyroid gland distinct, the clavicles and bony thorax unaffected. The knees were enlarged and crackled, the enlargement mainly affecting the ends of the bones. The ankles, wrists, and interphalangeal joints were similarly affected. The finger-nails were greatly enlarged. "The thick wrist, scarcely-altered carpal region, long spindle fingers, and large curved nails show the diagnostic points differentiating from the short spade-like hand, with unaltered nails and sausage fingers, of acromegaly."

EMPHYEMA.

Withington³ reports 4 cases of metapneumonic empyema from his own service in the Boston City Hospital, and abstracts 9 others from the reports of the same hospital. From the study of these he concludes that in all pneumonias where dyspnea or weakness follows the crisis, effusion should be suspected, and aspiration undertaken for purpose of diagnosis. If pneumococci alone are found, the pleurisy may be regarded as a phase of the pneumonia and not as a complication. The prognosis is comparatively good, and there is a slight chance that simple aspiration will suffice to cure the condition.

¹ Pester med.-chir. Presse, No. 25, 1894.

² Brit. Med. Jour., No. 1723, 1894.

³ Boston Med. and Surg. Jour., Jan. 3, 1895.

Rosenstock¹ reports from the clinic of Prof. Schreiber an interesting case of empyema occurring in a woman of thirty-five years, and having its onset three weeks after childbirth. The disease began with the symptoms of acute pleurisy, which subsequently subsided, giving place to fever and night-sweats. She came under observation several months after the onset, having the signs of a large effusion. On exploratory puncture this proved to be pus. She refused operation and remained in the hospital under medical treatment for three months, when there was still much pus in the chest. A year later the patient returned, and every vestige of a pleural exudate had disappeared. There had been practically no treatment. The author calls attention to similar cases reported in literature which show the possibility of spontaneous absorption of the pus of empyema. This is specially frequent in childhood and in the metapneumonic empyemas, but also occurs in empyema following various infections, particularly influenza.

Laache² in calling attention to the advantages of resection in the treatment of empyema warns against the danger of sudden death, which may occur at even a considerable interval after the operation. The statistics of his own experience show among 47 cases 29 complete cures, 3 in which a fistula was left, and 11 deaths.

Cumston³ records 6 cases of empyema treated by the siphon method of Revilliod, in all of which the result was satisfactory, and which ordinarily would have been considered incurable.

DISEASES OF THE CIRCULATORY SYSTEM.

DISEASES OF THE PERICARDIUM.

Eichhorst⁴ found by injecting the liquid of cases of pericarditis into animals that a notable percentage are tuberculous in nature. Among 27 cases of serous pericarditis, 8 were thus found to be tuberculous. He points out that the mere microscopic examination often fails to reveal bacilli in serous pleurisy and pericarditis. [This view is that which has been repeatedly expressed, and is undoubtedly founded in fact.]

Josseraud⁵ claims to have discovered a new physical sign indicative of acute pericarditis which precedes the friction sound. This is a peculiar loud, metallic character of the second sound over the pulmonic area. He would explain this by the supposition that the cardiac wall in this situation is thickened by congestion, and therefore transmits the valvular sounds clearly to the ear. The sign later gives place to the friction. Warthin⁶ also points out the importance of accentuation of the pulmonary second

¹ "Ueber spontane Resorption des Empyems," Inaug. Diss., Königsberg, 1894.

² Deutsch. med. Woch., No. 32, 1894. ³ Boston Med. and Surg. Jour., Nov. 22, 1894.

⁴ Univers. Med. Jour., June, 1895. ⁵ La Semaine méd., Nov. 3, 1894.

⁶ Med. News, April 13, 1895.

sound in the diagnosis of pericarditis, giving the notes of 5 cases in which it was present. Fisher¹ calls attention to the occurrence of a presystolic murmur in cases of adherent pericardium without valvular disease of any kind.

V. Eiselberg² records an instance of purulent pericarditis following traumatism which was permanently relieved by incision, and he makes this the basis of an historical review of the subject. Notwithstanding the happy influence in his own case, he inclines rather to the preliminary use of aspiration.

Harris³ has collected the cases of indurative mediastinopericarditis recorded in literature, and reports 3 additional instances. Postmortem, two varieties may be distinguished—one of adherent pericardium with marked increase of the fibrous tissue in the mediastinum, the other of adherent and thickened pericardium without general mediastinitis. There are in addition rare instances of a third group, in which fibrous mediastinitis is unassociated with pericarditis. Of the 22 cases collected, only 2 were over thirty years, and the male sex was affected over three times more frequently than the female sex. Some acute illness, and especially pericarditis, generally preceded, and some of the cases were tuberculous. The symptoms are chiefly dyspnea, venous stasis, cyanosis, enlargement of the heart and liver, dropsy or ascites, pulsus paradoxus, and inspiratory swelling of the vessels of the neck. The duration is indefinite, and death results from cardiac failure.

DISEASES OF THE HEART.

Acute Endocarditis.—[The importance of recognizing gonorrhea as a disease liable to bring about widespread disorders is well illustrated by the recent investigators regarding gonorrheal endocarditis. Doubtless such cases are more common than is as yet believed.] Fressel⁴ reports the case of a young woman brought to the hospital in an agonal condition. The only history obtained was that she had begun to suffer with pain in one foot four weeks before, and with excessive dyspnea the day before admission to the hospital. There were signs of pulmonary edema and failing heart. The autopsy showed ulcerative endocarditis of the aortic and mitral valves, edema of the lungs, and gonorrheal vaginitis. The histologic examination disclosed small diplococci in the valvular lesions. These corresponded pretty closely with the gonococcus. The author cites three previous demonstrations of probable diplococci of gonorrhea in endocardial lesions—those of Rohtmund, His, and Leyden.

Prévost⁵ reports a case in which endopericarditis followed acute gonorrhea, which was treated by injection of solutions of potassium permanganate under a pressure of 1.50 m. The cardiac trouble began suddenly

¹ Lancet, March 9, 1895.

² Wien. klin. Woch., No. 2, 1895.

³ Med. Chronicle, Nov., 1894, etc.

⁴ "Endocarditis Gonorrhoeica," Inaug. Dis., Leipzig, Edelmann, 1894.

⁵ Arch. méd. Belges, Jan., 1895.

some hours after the injection. There were—pain over the heart, becoming intense; rapid action of the heart, and a soft murmur of mitral insufficiency. The temperature was 102.4° F. In a review of the whole subject he finds that any part of the heart is liable to involvement after gonorrhea, though the endocardium, and especially the mitral valve, suffer most frequently. The endocarditis may be simple or malignant, the former terminating in chronic valvular disease, the latter causing death with the clinical features of widespread pyemia (hemorrhages in the skin, multiple abscesses, arthritis). [The question of the significance of the gonococcus in the production of these complications is doubtful. Hering found them in the vegetations, as has Councilman in the heart-muscle; Wilms arrived at an opposite conclusion.]

Litten,¹ in referring to the subject of *peliosis rheumatica*, calls attention to the fact that the petechiae in such cases are dependent upon some complicating condition added to the existing rheumatism, usually endocarditis. In particular, he directs attention to the importance of recognizing gonorrheal endocarditis as a cause of the clinical manifestations designated by the name *peliosis*. Three cases of these have occurred in his experience. Their clinical history is much the same. After an attack of gonorrhea mild febrile reaction and repeated eruptions of petechiae are noted. The prognosis is good. Two forms may be distinguished: a milder, rheumatoid variety, characterized by warty exerescences and dependent immediately upon joint complications in gonorrhea; and a more serious, ulcerative or septic form, which is dependent upon periurethral infection.

Leyden,² in referring to the bacteriology of malignant endocarditis, refers to 6 cases of endocardial inflammation accompanying rheumatism, in 4 of which a diplococcus was found in the vegetations quite different from other microorganisms, such as the pneumococcus, staphylococcus, etc. Guenther looked upon this as a special form not hitherto described. In 2 of the cases there were ulcerous lesions, in 3 verrucose endocarditis, and in 1 extensive cellular and fibrinous changes in the myocardium, the valves remaining intact. Girardeau³ points out that acute endocarditis sometimes occurs in the course of carcinoma, hemiplegia, or tuberculosis, and that in these cases there is usually secondary infection in the course of the original disease. In pulmonary tuberculosis, however, the tubercle bacillus itself may be the immediate cause.

Romberg⁴ contributes another interesting study of the myocardium in disease. His present work deals with the heart-muscle in acute endocarditis and in chronic valvular disease. Most interest will attach to the former on account of the novelty of the discoveries. Romberg points out with justice the error that has been all but universal—viz. that the symptoms of acute endocarditis are due to valvular defects. A little study of the lesions and of the symptoms would, however, indicate that there must be an underlying

¹ *Centralbl. f. Innere Med.*, Jan. 5, 1895.

² *Deutsch. med. Woch.*, Dec. 6, 1894.

³ *Med. Week*, Oct. 19, 1894.

⁴ *Deutsch. Archiv f. klin. Med.*, June 26, 1894.

myocardial weakness of some kind, and it has been the special aim of the first part of his work to determine the nature of this. He was able to study only two cases (both purely verrucose rheumatic endocarditis), but the histologic changes in these were so similar and so suggestive that the results are no doubt of great value. In both cases there was found some parenchymatous degeneration, but more especially acute interstitial myocarditis and hyaline thrombosis of many small blood-vessels of the myocardium. The seat of the interstitial inflammation was mainly near the auricular junction, where it would doubtless contribute to disturbances of the functional activity of the valves. The thrombosis of the vessels was the more striking condition. It affected almost exclusively small arteries, and must from its extent have caused considerable disturbance of the action of the heart-muscle. The contributions to the pathology of valvular disease are much less novel, but are interesting, nevertheless. He points out that in chronic valvular disease more depends upon the condition of the myocardium, as a rule, than upon the valvular defect itself. The myocardial troubles may be ascribed to three causes—fatigue, dilatation, and myocardial changes. The latter consist of various parenchymatous degenerations and of interstitial myocarditis with formation of fibrous tissue.

Lloyd and Riesman¹ record a case of malignant endocarditis that occurred in a patient who had been much exposed to hard out-door work during a severe winter, and who was taken rather suddenly ill with severe pains in his back and limbs and with fever. Subsequently characteristic symptoms of malignant endocarditis of the typhoid type developed, but in addition to this there was widespread multiple neuritis, doubtless of septic origin. They record also a second case in which there were multiple abscesses in the brain, infarctions in one kidney, and an embolus in the left brachial artery, all in consequence of a vegetating mass attached to the lining of the aorta near the valves.

Pepper and Stengel² call attention to the great frequency of malignant endocarditis, particularly the form occurring as a complication in chronic valvular disease. They insist that there is no sharp line of division between simple and malignant cases. Three cases are reported in detail, and the points by which the diagnosis was established are indicated.

CHRONIC VALVULAR DISEASE.

Etiology.—Pennell³ thinks that the influence of chronic rheumatism in producing heart-lesions has been underestimated. He refers to 25 cases in which the rheumatism was chronic from the beginning, and in 18 of which a gradual development of heart-failure was induced in the course of years.

Ashton⁴ analyzes 1024 cases of chronic valvular disease occurring in the course of examinations of applicants for insurance. The order of frequency of the various lesions and combination of lesions was as follows: Mitral in-

¹ Am. Jour. Med. Sci., Feb., 1895.

² Med. News, Sept. 8, 1894.

³ Univ. Med. Mag., May, 1895.

⁴ Ibid., June 30, 1894.

competency, males 295, females 262; aortic stenosis, m. 101, f. 35; double aortic with mitral incompetency, m. 65, f. 28; aortic incompetency, m. 32, f. 15; aortic stenosis and mitral incompetency, m. 31, f. 14; double aortic, m. 27, f. 11; aortic incompetency and mitral incompetency, m. 26, f. 7; mitral stenosis, m. 15, f. 17; double mitral, m. 13, f. 19; tricuspid incompetency, m. 7, f. 4.

[The proportion of cases of pure aortic stenosis, though it agrees with some previously published statistics, is surprising when the anatomic conditions present in chronic aortic disease are considered. The author does not state what care was taken to exclude systolic murmurs of aortic atheroma or functional aortic murmurs. Again, as he himself observes, the low percentage of cases of mitral stenosis with or without incompetency is remarkable. We do not believe that any deductions as to age and sex should be drawn from statistics based upon cases selected from such a source as insurance examination, in which the male sex and certain ages are likely to be in great excess.]

In seeking for causes he found 37.40 per cent. of all apparently due to rheumatism; 10 per cent. to infectious fevers; 9 per cent. to syphilis; and 18 per cent. to alcoholism. In 21 per cent. no cause was discovered. In 31 per cent. of all, disease of the blood-vessels was detected.

Symptoms in the Several Lesions.—McPhedran¹ reports a case of mitral stenosis that occurred in a man of thirty-five years, and had probably existed for fifteen years. He passed through an attack of grip and one of pneumonia without evidence of heart-weakness, but after the latter the heart began to lose power. He died of pulmonary hemorrhage. A feature of the morbid anatomy was the presence of great hypertrophy without dilatation of the right ventricle. Huehard² points out that in mitral stenosis the dangers are mainly pulmonary, and reviews the chief accidents of this nature. In the very first instance there is dyspnea due to failure of the left ventricle to receive a proper supply of blood. Next, the stasis of blood in the pulmonary veins increases the breathlessness. Further, the "cycle aberrant" of Renault is likely to develop. This is the communication between the pulmonary and the bronchial vessels liable to result from excessive congestion, and as a consequence of which a part of the unoxygenated pulmonary blood returns directly to the right heart. In rare cases high grades of dyspnea may ensue from direct pressure of an enlarged left auricle upon the bronchus, and finally intracardiac thrombi may occlude the entrance of the pulmonary veins.

[Austin Flint first pointed out that the presystolic murmur is not invariably indicative of mitral stenosis. Numbers of observers have since confirmed this view.

[Difficulty is experienced in some cases of aortic regurgitation from the fact that the ordinary murmur is indistinct and a presystolic apex-murmur prominent.] Fisher³ records 3 such cases in which a presystolic murmur

¹ Internat. Med. Mag., June, 1894.

² Méd. moderne, No. 61, 1894.

³ Lancet, March 9, 1895.

was found over the apex of the heart, and in which aortic regurgitation, but no mitral stenosis, was found postmortem. In one of these it was of interest to note that the endocardium upon the septum ventriculorum was thickened, showing the point of impact of the regurgitant stream of blood, and it is therefore properly assumed that Sanson's theory, which would explain the presystolic apex-murmur as due to a fluttering of the anterior mitral leaflet on account of impact of the blood-stream, is incorrect, at least in some cases.

The author has collected 12 cases of diastolic or presystolic apex-murmurs occurring without mitral stenosis or disease of the aortic valves. In 8 of these the pericardium was universally adherent, and in only 2 was it healthy. In 5 other cases of general adhesion of the pericardium a presystolic apex-murmur was heard, but they have been excluded because the pathologists thought the aortic valves probably incompetent.

Regarding the view that a similar murmur may be due to dilatation of the heart, he remarks that in the Guy's Hospital records for twenty years there was only one instance, and he rather inclines to think that some disturbance of innervation was present in that case.

Steele,¹ in discussing the pulse in aortic stenosis, points out that while the sphygmographic tracings may show the pulse to be anacrotic or bisferiens, these are not necessarily pathognomonic, but that taken in conjunction with other signs they have a diagnostic value.

Oliver² calls attention to the great rarity of acquired pulmonary valve-lesions, particularly the regurgitant form, and records a case of a woman of sixty years who presented the last-named condition. There was no history of rheumatism, but the woman, who had always worked hard, took "cold" four years before, and from that time on suffered from dyspnea. There was a faint apex systolic murmur and a louder diastolic bruit at the pulmonary area and down to the left side of the ensiform cartilage. Pleural effusion, congestions, and epistaxis developed, and the woman died exhausted. Post-mortem the lesion discovered was pulmonary regurgitation, due to slight atheromatous lesions of the segments.

Ashton and Stewart³ detail a case of tricuspid stenosis associated with narrowing of the mitral and aortic orifices in a man of nineteen years. The patient had measles at six years and influenza at fifteen. At various times he suffered with vague rheumatic pains, but there was no outspoken history of rheumatism. He had never been very active at play or work. The authors further tabulate 13 cases collected from literature, which, with the 114 contained in Leudet's table, make the total number of recorded cases 128, including their own. [In general the study of the recent cases collected by the authors adds no new facts to the observations of Leudet.] Hamburger⁴ records an interesting case of tricuspid regurgitation confirmed by autopsy, in which the only physical sign of prominence was the pulsation of the veins of the neck. There was no murmur.

¹ Lancet, London, Nov. 24, 1894.

³ Am. Jour. Med. Sci., Feb., 1895.

² Brit. Med. Jour., July 7, 1894.

⁴ Deutsch. med. Woch., No. 22, 1894.

Hochhaus¹ reports a case of patulous ductus Botalli which was diagnosed during life. The patient, a man of twenty-four years, died of acute endocarditis. Heart-dulness was increased to right and left, and there was a systolic murmur at the apex. At the aortic cartilage there was a loud first sound, and a faint murmur with the diastolic sound. Over the pulmonary cartilage there was a prolonged whistling diastolic murmur. This was also heard over the left side of the back. The patient was well until his twelfth year. The section showed that the murmur was diastolic, because the duct was much contracted at the aortic end, which prevented flow into the aorta during systole on account of the pressure in the aorta; but in diastole the blood of the aorta slowly entered through the narrow orifice.

General Symptoms of Valvular Disease.—Under the name of *Frustrane Herzcontractionen*, Hochhaus and Quinke² refer to instances of cardiac affections in which the pulse becomes decidedly weak, and yet at the same time the heart-beat remains strong. The heart-sounds are variable, sometimes strong and sometimes weak. Fourteen such cases, including 5 of mitral regurgitation, 4 of aortic and mitral disease, and 5 of myocardial disease, have come under their observation, and they detail the history in 8 of these cases. They conclude from their studies that the explanation of the paradoxical condition is found in the assumption that there is a form of cramp-like action of the heart-muscle which leads to a sharp heart-beat, but to an insufficient wave of blood; and it is to designate this abortive effort of the heart that they have used the title named above.

Husche³ made careful chemie studies in the various stages of compensation and loss of compensation. In a majority, but not in all, of the cases there was a retention of nitrogenous material during loss of compensation, with increased discharge during the reestablishment. In general there was a certain, though by no means accurate, relation between the quantity of urine discharged and the quantity of nitrogen excreted.

Schneider⁴ makes a further contribution to the same subjects as those investigated by Husche. He also finds that no general rule can be given for the quantity of nitrogen eliminated in heart-disease. There is no constant relation of the amount of water excreted by the kidneys and the amount of urea. The retention of water is really of more significance in failure of compensation than the retention of nitrogenous substances. The edematous liquid in heart-disease contains very little urea.

Guderley,⁵ in reporting a case of gangrene of the left foot occurring in a case of aortic and mitral valvular disease and dependent upon marantic thrombosis, has studied the literature of the subject, and was able to collect 19 similar instances previously recorded. In his own case the postmortem

¹ Deutsch. Archiv f. klin. Med., 51, 1.

² Ibid., Sept., 1894.

³ "Ueber die N.-Bilanz bei Herzkrankheiten," Inaug. Diss., Berlin, 1894.

⁴ "Stickstoff-Bilanz bei Kranken die an Herzklappenfehlern leiden," Inaug. Diss., Berlin, 1894.

⁵ "Ueber extremitäten Gangrän bei Herz-Insuffizienz," Inaug. Diss., Greifswald, 1894.

section showed thrombosis of the femoral artery and of the aorta as high up as the renal arteries. This was entirely due to thrombosis. No vestige of a primary embolus existed. Numerous hemorrhagic infarctions of the lungs were the immediate cause of death, and occurred shortly before the fatal issue.

Kleiber¹ found in an analysis of the cases of cerebral hemiplegia associated with heart-disease, occurring in the service of Prof. Eichhorst during ten years, the following facts: In 396 cases of valvular disease cerebral hemiplegia occurred in 43, of which 28 were women and 15 men. The cardiac lesion most frequently associated was mitral regurgitation. The cause of the hemiplegia was embolism in but 8 of 20 cases in which autopsy was performed. In the other cases it was hemorrhage, excepting 1 of mitral stenosis in which thrombosis occurred.

DISEASES OF THE MYOCARDIUM.

Acute Myocarditis and Myocardial Degenerations.—Romberg² contributes a most important communication on the acute myocardial lesions of typhoid fever, scarlatina, and diphtheria. In the first the highest grades of parenchymatous degeneration are reached by the end of the second week, and then slowly subside. Interstitial myocarditis usually begins at the end of the second week. In scarlet fever interstitial myocarditis begins as early as the fourth day; in diphtheria, about the seventh or ninth day; and in each it reaches its height about the end of the second week. In diphtheria fatty degeneration is more characteristic; it may begin quite late.

[Fragmentation of the muscle-fibers of the heart, the *myocardite ségmentaire* of French writers, has engaged considerable attention, and deserves more extended study. Notwithstanding the views of Zenker, Recklinghausen, and others, many authors believe this to be an important clinical condition, and not merely a postmortem change.]

Tedeschi³ has made some experimental studies of fragmentation of the myocardium to determine the nature of this trouble. Animals were infected with the microorganism, the vagi were cut, and the central nervous system was irritated, and finally heated needles were thrust into the heart-substance. Only the last-named procedure brought about any fragmentation, and that only in the immediate vicinity of the injury. Israel⁴ believes that mechanical rupture of the fibers is the important causal factor, but thinks some predisposing weakness of the heart-muscle is necessary. Evidence of the latter is found in the fact that frequently fragmentation occurs only in the areas of the heart in which there is some fatty or other degeneration, and that the condition is rare in children, in whom myocardial disease is least common. Browicz⁵ agrees with Israel regarding the predisposing myocardial disease. Browicz also calls attention to the fact that fragmentation of the myocardium is much more common than has usually been supposed. In 236

¹ Inaug. Diss., Basel, 1894.

² Deutsch. Arch. f. klin. Med., xlix., parts 4 and 5.

³ Virchow's Archiv, vol. cxxxiii. Heft 2.

⁴ Ibid., Heft 3.

⁵ Ibid., Heft 1.

cases he found the condition in question 112 times. In severe infectious diseases it was present in 82 per cent. of the cases; in cerebral diseases, in 92 per cent.; in cases of heart-disease, in 50 per cent.; and in death from shock (after severe operations) he found it in each of 10 cases examined. Dunin¹ shows that fragmentation of the fibers may be brought about in portions of heart-muscle placed in water and allowed to undergo putrefactive change. Under these conditions he found regularly a peculiar bacillus, and was led to look upon the fragmentation as a result of peptonization. Further experiment showed that artificial digestion of the heart-muscle led to fragmentation in a short time. In 2 cases of persons who died of heart-failure he found fragmentation and the same bacillus, which from its general appearances he regarded as the bacillus coli communis. Hobbs² reports a case of typhoid fever occurring in a patient of nineteen years, in which during apparently normal progress there was sudden death, and in which the autopsy showed marked segmentation of the fibers. There was also remarkable enlargement of the nuclei of the fibers, but no interstitial change at all. The author remarks that when the latter occurs, irregularity of the pulse with dyspnea and the like are common, but in cases of segmentary myocarditis no clinical symptoms at all are noted.

Hypertrophy and Dilatation.—Christ³ has investigated the question of the effect of muscular exercise upon the heart. He recognizes that cardiac dilatation will probably result from over-exertion more easily in certain persons and after certain diseases than in the completely healthy man, and has sought to determine this greater susceptibility of the heart to yield to strains. By means of an ingenious apparatus, in which the legs are exercised as in climbing, he was able to subject individuals to various degrees of work, and under these circumstances the greater frequency of the pulse was noted as an indication of increased strain. He determined in this way that convalescents, from typhoid fever in particular, show cardiac acceleration with small degrees of work as compared with healthy persons. In a few such convalescents he was able even to recognize transitory dilatation of the right heart as a consequence of very slight exertion. The nature of his results is summed up in the one statement that 1000–2000 kg. of work caused the same amount of cardiac excitement in convalescents as 5000 to 7000 kg. in healthy persons.

Herschell⁴ calls attention to the danger of cardiac disease following bicycle-riding, and points out that the temptation to over-exercise is mainly responsible for this. In one of his cases a man of forty-six years attempted to ride 53 miles, and at the end became seriously ill. He was cyanosed and exhausted; there was intense dyspnea; and the pulse-rate was 144, the waves irregular and weak. Dulness extended from the left mammary line to beyond the right border of the sternum. In another case a man thirty-one years of age complained of shortness of breath and palpitation. There

¹ Ziegler's Beiträge zur path. Anat., Bd. xvi. Heft 1.

² Médecine de Méd., No. 6, 1895.

³ Arch. f. klin. Med., Bd. liii. H. 1 and 2.

⁴ Lancet, Mar. 2, 1895.

was evident hypertrophy, the apex being in the anterior axillary line, the right margin of the heart a half inch to the right of the sternum. The root of the aorta was dilated; there was an accentuated second sound over the aorta, but no murmurs. More frequently he has found functional disturbances, such as palpitation with dyspnea, a sense of sinking at the epigastrium, consciousness of the heart's action, intermittency, and even, in two cases, anginoid attacks.

Jacob¹ describes a class of cases of acute transitory dilatation of the heart, becoming chronic from repetition, and affecting persons apparently well. The beginning is with a chill or often with pain in the extremities. Coldness, pallor, sweat, altered sensation, vertigo, and disappearance of vision follow. The pupil is dilated; the patient is anxious, has dyspnea, pain at the heart, and an extremely hard pulse. The heart enlarges. In severe cases pulmonary edema and albuminuria appear. After a few hours or days the symptoms disappear. The nature of these affections, the author believes, is a general spasm of the blood-vessels, which raises blood-pressure and leads at first to acute and finally to lasting cardiac dilatation. In acute cases injections of morphin are of the greatest service.

Heftler² considers the question of the coincidence of pulmonary tuberculosis and cardiac disease, and shows that, in the first place, certain congenital cardiac affections, particularly pulmonary stenosis, predispose to tuberculosis of the lungs, and in the second place cardiac affections of several kinds are more or less prone to occur in the course of phthisis. Among such is tuberculosis of the pericardium. More commonly, and quite at variance from the old belief in the constant association of atrophy of the heart with phthisis, it is found that the right ventricle is dilated as in emphysema. Finally, there may be true hypertrophy.

Wilson³ in a clinical lecture on dilatation of the right ventricle described two types—the adolescent, in which the heart is more yielding, and the adult, in which the heart is stiffer. The signs of dilatation were taken up systematically, and the clinical value of each carefully weighed.

De Dominicis⁴ contributes some interesting experimental investigations of nephritis and the relation of kidney-disease to idiopathic hypertrophy of the heart. He was able to produce degenerations of the epithelium and interstitial nephritis by ligation of the artery of one kidney in dogs. There was no associated cardiac enlargement, and no general indications of nephritis. From the experimental and clinical evidence he is led to believe that when kidney-disease and hypertrophy of the heart are associated each is due to a primary chemie poisoning of the blood.

Myocardial Tumors.—Pawlowsky⁵ reports a most interesting instance of polypoid tumor of the left auricle obstructing the mitral orifice, and has collected and analyzed the reported instances of similar cases. Regarding

¹ Centrabl. f. Innere Med., No. 5, 1895.

² Jour. de Méd. de Paris, Nov. 18, 1894.

³ Lancet, London, Sept. 3, 1894.

⁴ Wiener med. Woch., Nov. 17–24, and Dec. 1, 1894.

⁵ Berlin. klin. Woch., May 6, 1895.

the clinical features, it was found in all cases that the symptoms were those of disease of the heart-muscle or of the valvular mechanism, but there were no points of especial distinction, excepting that the clinical course was most irregular and failed to conform to any particular type of disease. His own case is perhaps the most instructive of all. It revealed a myxomatous polyp 8 cm. long attached to the posterior wall of the auricle and projecting through the mitral orifice. There were hemorrhagic infarets in both lungs. Clinically, the case divided itself into three periods: In the first the symptoms were indefinite. In the second there were from time to time attacks of paresis of localized areas, especially of the eyes and tongue; also remarkable temporary attacks of palpitation and feeling of suffocation, and temporary loss of consciousness. The patient's condition varied from one of comfort to one of extreme depression from day to day; she was rarely comfortable in the sitting posture, and on physical examination while in that position signs of mitral stenosis were present, whereas in the recumbent position the signs were those of mitral regurgitation. The third period of the disease lasted a very short time until death ensued. The author has collected and analyzed 7 cases of myxomatous and 3 of fibrous polyps of the heart. This analysis shows that the cases are equally divided between the sexes, and that the symptoms are indistinctive and irregular as before stated. Prognosis would seem to be more unfavorable in men than in women.

Myocardial Tuberculosis.—Mendez¹ records 2 cases of tuberculosis of the substance of the heart, and refers to 29 collected from the literature. The first and most interesting of his cases was that of a negro fifty years of age, whose left lung, thoracic vertebrae, liver, spleen, and mesenteric glands were tuberculous, and in whom there was a large infiltrating tuberculous mass of the right auricle almost the size of a normal heart. The walls of the auricle were yellow in color, 1 to 1½ cm. thick, and contained a number of tumors nearly the size of a pigeon's egg. The endocardium was covered with grayish-yellow granulations. Tubercle bacilli were found in great numbers. The second case was of less interest, being one of small isolated tubercles in the substance of the heart.

Aneurysm of the Heart.—Th.-Georgiadés² reports a case which occurred in a man of sixty-five years. There were loss of appetite, great weakness, emaciation, and pallor. The heart was not seemingly enlarged; the beat and the sounds extremely weak. Death occurred without any definite symptoms being developed. There was a small aneurysm the size of a walnut at the apex of the left ventricle. There were general atheroma and contraction of the liver and kidneys. The symptoms in the collected cases had a certain similarity, though in one this symptom, in another that, was most prominent.

Treatment of Chronic Valvular and Myocardial Diseases.—Eccles³

¹ Revista de la Soc. Med. Argentina, July and August, 1894; Centralbl. f. Innere Med., Feb. 16, 1895.

² Zur Kenntniss der Herz-Aneurysmen, München, 1894.

³ Pract., Aug., 1894.

commends very favorably methods of gradually increased exercise in the treatment of cardiac disease, and instances a number of conditions in which he has found it especially valuable. He begins with massage, and later orders passive movements and gentle exercise in bed, and finally light gymnastics, until the patient is able to exercise in the open air. The great danger is the liability to overdo the matter of exercise at the critical point when improvement is beginning to assert itself.

[The method of systematic gymnastic exercises combined with warm bathing instituted by Schott of Nauheim has received considerable attention. Schott himself records additional evidences in favor of this plan, and others confirm his views.] Among these Babcock¹ reports 19 cases of chronic heart-disease treated by this method, and found it of signal advantage. He admits that the method may be dangerous when degeneration of the blood-vessels or myocardium exists. Smylie² confirms the observations of Schott, and recites a striking case in point. Broadbent³ regards as suitable cases for the mechanic and hydrotherapeutic treatment of Schott instances of cardiac dilatation due to overwork, cases of mitral disease when the right ventricle is beginning to fail, and adherent pericardium with symptoms of cardiac embarrassment. Aortic regurgitation is not suitable as a rule, and in cases of aneurysm or angina pectoris it must be employed with the greatest caution, while in cases of fatty infiltration benefit may be expected. Hasebroeck⁴ contributes an interesting paper on the effect of exercise on the blood-pressure and circulation. His sphygmographic curves showed decided increase of their amplitude when the person under experiment made active muscular movements. This was especially marked when the exercise was sufficient to cause fatigue and when deep inspiratory efforts accompanied the muscular exertion. He ascribes these results to relaxation of the peripheral vessels. With the sphygmometer there was found under the same conditions increase followed by decrease of the blood-pressure, which he regards as evidence of increased action of the heart, sufficient at first to cause increase of the blood-pressure, but not sufficient after the vascular dilatation has begun. He agrees with Oertel's views regarding exercise in heart-disease, but recommends the method of Zander as the best.

Packard⁵ in a general discussion of the uses of venesection commends this treatment as particularly desirable in certain forms of mitral disease with venous stasis.

Sloan⁶ contributes an interesting review of cardicentesis based upon a personal observation. In his own case, following upon facial erysipelas of five years' duration, a nineteen-year-old girl developed rheumatism, in which pericardial friction occurred, and after a week and a half a mitral systolic murmur, elevation of pulse-rate and temperature, and rapid increase in the size of the heart. The dorsal position was the only one in

¹ N. Y. Med. Jour., No. 836, 1894.

² Dublin Jour. Med. Sci., Sept., 1894.

³ The Pract., May, 1895.

⁴ Festschr. gewidmet Theo. Thierfelder, Leipzig, 1895.

⁵ Univ. Med. Mag., May, 1894.

⁶ Edin. Med. Jour., Feb., 1895.

which she was comfortable. Difficulty in swallowing developed, and death seemed imminent from edema of the lungs. Paracentesis was undertaken to relieve pericardial effusion, but the right ventricle was penetrated and 300 g. of liquid blood were removed. Rapid improvement for twenty-four hours, and slower improvement after that, led on to complete recovery. The trocar was inserted in the fourth interspace 1.2 cm. to the left of the sternum. The return of the heart to the normal size was slow, so that the author believed there was really some pericardial fluid present. The principal danger in cardiacentesis he believes is that of puncturing the coronary artery. In the discussion of the case alluded to Byrom Bramwell referred to one of his own in which death occurred one half an hour after unintentional puncture of the heart. [One of the editors of this department some years since performed this operation with striking success, in a case in which death was imminent from over-distention of the right ventricle. Under such circumstances cardiacentesis may be thought of as a final and desperate resort.]

Babeock¹ objects to the statement of Fraentzel that rest is always deleterious in the treatment of heart-disease because it tends to cause degeneration from inactivity. Contrary to this view, he holds that the general belief in the necessity of rest is well founded, though in some cases of idiopathic hypertrophy too long protracted rest does seem injurious. This, however, he attributes rather to abnormal conditions thus established in the peripheral circulation than to any degeneration in the heart-muscle.

Glax² emphasizes his previous claims that one of the most important elements in the treatment of chronic heart-disease is the restriction of the quantity of liquid allowed the patient. In some cases this alone suffices to restore compensation, and in instances in which treatment has previously been unavailing this care of the diet in addition to the treatment proves effectual.

Wilcox³ calls attention to the value of vasoconstrictors in heart-disease. These act by regulating the work of the left ventricle, and thus bringing about hypertrophy. Digitalis is useful in this way in all cases in which the pulse is rapid and of low tension, and it is specially valuable from its slowing the heart, prolonging diastole, and rendering the systole more perfect. The author regards ergot as the most generally useful vasoconstrictor. He would combine with this in cases of heart-disease strophanthus or spartein, or, if the pulse is already slow, caffein, or, preferably, cactus.

Babeock⁴ gives the notes of 2 cases of failing compensation, 1 of which was relieved by digitalis, and the other apparently made worse. The conditions were carefully studied, the former being dilatation of the left ventricle, the latter dilatation of all the cavities; and the conclusion is drawn that digitalis, stimulating the left ventricle more strongly than the right, is contraindicated when both are dilated, until after the pressure in the right heart has been relieved by venesection or purgation.

¹ Jour. Am. Med. Assoc., Nov. 17, 1894.

² Med. Rec., Feb. 2, 1895.

³ Internat. klin. Rund., Oct. 7, 1894.

⁴ Jour. Am. Med. Assoc., June 8, 1895.

Pawinski¹ regards caffein as of especial use in functional and degenerative disease of the heart-muscle, and especially in the early stages. Sudden heart-strain, from emotion or during fevers, is particularly benefited by caffein.

NEUROSES OF THE HEART.

Etiology.—The importance of influenza as a cause of cardiac disorders of a neurotic kind has been frequently and justly dwelt upon. Sansom² has analyzed cases of cardiac trouble following influenza. Among 100 such cases, pain was found in 23, tachycardia in 37, arrhythmia in 25, bradycardia in 5, and organic heart-disease in 10 cases. He then analyzes more particularly 30 cases of irregularity of the heart after influenza, and divides them into—1. Groups presenting some of the signs of Graves's disease; 2. Cases manifesting perversion of the auditory function; 3. Cases manifesting gout or an hereditary tendency to gout. In the first group the similarity to Graves's disease was sometimes very striking. In a number of cases there was somewhat rhythmic irregularity; in a majority, however, there was no rhythm, and in a considerable number actual delirium cordis. Precordial pain was found in just half of the cases, and dyspeptic disturbances in 12 of the 30. A smaller number presented signs of peripheral neuritis. Decided exophthalmus was noted in 2 cases; in a third Stellwag's sign was manifested; while in several there was tremor of the elevator of the upper eyelid, and in a number tremor of the trunk and limbs. While the cases here reported for the most part incompletely resemble Graves's disease, the author has seen cases in which all of the cardinal symptoms were present. Of the second group of cases there were 6 in the total 30. Regarding the third grouping, the author remarks that he has noted the marked severity of implication of the nervous system after influenza in persons of a gouty type. Finally, all of these conditions are the result of nervous implication, and not of myocarditis or other structural change.

Gout is also referred to as a cause of cardiac disturbances by T. Mitchell Bruce,³ who contends for the recognition of the gouty heart as a distinct clinical entity, accepting as evidence of its existence a personal history of present or past declared gout, a personal history of free living and usually of hard work, with explosions of irregular gout, a relief of the symptoms by the usual methods successful in gout, and, lastly, the family history of pure gout or allied affections. The disease begins, as a rule, at about forty years of age in men of the history indicated. At first there are vague indications; later, and characteristically, come pain or oppression, palpitations, and attacks of faintness. The physical signs on examination of the heart are characterized by their indefiniteness. The disease goes on in about the same way, being aggravated by work or irregular life, and relieved by care and diet and mild treatment. The prognosis is decidedly good. The patients do not die, and there seems to be no marked tendency to the development

¹ Therap. Monatsheft; Pacif. Med. Jour., Oct., 1894.

² Brit. Med. Jour., Nov. 10, 1894.

³ The Practitioner, Jan., 1895.

of organic disease. [Our own observations strikingly bear out some of Bruce's observations, and, like Sansom, we have found the combination of a gouty tendency and influenza particularly prone to occasion neurotic disturbances of the heart's action.]

Tachycardia.—Martinus¹ contributes a most interesting review of the subject designated by the title, and, basing his observations upon one of his recorded cases, offers a new theory which he believes is applicable at least in certain cases. The case in question was one in which there were severe sudden attacks of rapidity of the heart, reaching 260 beats per minute, in which the pulse was entirely regular, the patient extremely weak, and a feeling of pressure or oppression of the chest and decided dyspnea. Physical examination revealed enormous enlargement of the heart occurring during the attacks. The author believes the last to be the primary cause of the paroxysms, the cardiac rapidity being secondary and compensatory, and he calls attention to the fact that in cases of palsy of the vagus or reflex disturbance the pulse rarely runs beyond 150, and enlargement of the heart does not occur. Fritz² contributes an interesting study of paroxysmal tachycardia, with the histories of 6 cases given in great detail. On the basis of these and previously recorded cases he studies the disease systematically. The conclusions regarding the pathogenesis are of particular interest. Most cases, he believes, are due to paralysis of the vagus, though a few result from stimulation of the sympathetic. In either case the seat of disease is central, excepting in the cases of reflex tachycardia. In cases in which there is great rapidity of the pulse a double affection of vagus and sympathetic is probably present. It is possible that some cases are due to disease of the intracardiac ganglia; in these the pulse is rather slow.

Angina Pectoris.—Nine cases of angina pectoris occurring in the course of diabetes are reported by Vergeby,³ 4 of which have been previously recorded by him. Of the 5 new ones, 3 died during an attack; the other 2 recovered after some time. In none was any disease of the heart or blood-vessels discovered. There were no postmortem examinations. The author suggests that the direct action of the sugar upon the nerves of the heart may have occasioned the paroxysms, which are in nowise distinguishable from true angina. The diminution of the sugar coincident with the improvement of the symptoms in the two cases referred to confirms his view.

Mackenzie⁴ details a number of cases of cardiac pain especially with reference to the relation of the area involved to the nerve-supply. In some of these the strict dependence of the pain and hyperesthesia upon the distribution of underlying nerves is shown by the occurrence of herpes zoster in the same area as the pain.

Exophthalmic Goiter.—Reinhold⁵ records a case of a woman aged thirty-five who developed acute strumitis following after an attack of influ-

¹ "Tachycardia," F. Enke, Stuttgart, 1895.

² Inaug. Diss., Uster-Zürich, A. Gall, 1894.

³ Jour. de Médecin de Bordeaux.

⁴ Lancet, Jan. 5, 1895.

⁵ Münch. med. Woch., No. 23, 1894.

enza. Subsequently unequivocal symptoms of exophthalmic goiter were developed. The author denies that this is an instance of acute febrile onset of Basedow's disease in the course of influenza, since there was an interval of several weeks between the acute thyroiditis and the development of Basedow's affection. He refers also to the case of a young girl of nineteen who suffered with scarlet fever in 1892, and at the same time presented a nonpulsating parenchymatous goiter. Soon after her discharge from the hospital typical symptoms of Basedow's disease developed, and the struma increased in size and became distinctly vascular. The author reviews the various theories regarding this disease, and, basing his opinion mainly on these two cases, inclines to the view that infection plays a prominent part. Garrison¹ reports a case of Graves' disease in an infant of but three months. An hour after birth there was decided cyanosis. The exophthalmus followed after severe gastrointestinal symptoms, and two months later, though there had been decided improvement, tachycardia, with sweating and loss of power, developed. Complete cure followed the use of arseniate of strychnia.

Patrick² has investigated the subject of chest-expansion in cases of exophthalmic goiter. Dr. Louise Bryson some years since maintained that diminution of the vital capacity or chest-expansion is a characteristic sign of Graves' disease, and a number of clinicians have concurred in this view. Patrick examined 40 cases, taking only such as were unmistakably instances of this disease, and found that there was an average diminution, but that this was dependent upon, and in the individual cases more or less proportionate to, the amount of general muscular weakness. As a basis of comparison he examined 28 persons suffering with various diseases, and found the average expansion to be 4.8 cm., and the average power as measured by the dynamometer to be 56.36 kg.; whereas in the 40 cases of Graves' disease the average expansion and power were 4.3 cm. and 43.75 kg., respectively. It is to be remarked that almost the half of his cases at some time or continuously showed greater expansion than the control cases.

Lemke³ holds that the diagnosis of Graves' disease may be made when delirium cordis and tremor are present, but not without these, all other symptoms being secondary and comparatively unimportant. He believes that the cause is a faulty chemical influence of the thyroid gland on the blood, and in particular the formation of a substance which acts as a direct muscle-poison to the heart and general muscular apparatus.

Voisin⁴ at a meeting of the Soc. Méd. des Hôpitaux reported a case of exophthalmic goiter in which marked improvement followed the use of sheep's thyroids. In the discussion Dreyfus-Brisac and Bécélère stated that in their experience thyroid gland aggravated the symptoms.

Owen⁵ has recorded the favorable effect of administration of thymus gland in exophthalmic goiter, and Cunningham⁶ adds 3 further cases in

¹ Jour. Am. Med. Assoc., Nov., 1894.

² Deutsch. med. Woch., Dec. 20, 1894.

³ Brit. Med. Jour., Feb. 16, 1895.

⁴ N. Y. Med. Jour., Feb. 9, 1895.

⁵ Semaine méd., Oct. 24, 1894.

⁶ Med. Rec., June 15, 1895.

which there was a similar favorable result. In the cases reported by these authors, as Cunningham points out, there was not a primary hypertrophy of the thyroid with secondary Graves' disease, and the same author inclines to believe that such cases will prove refractory to the treatment.

Chibbet¹ speaks of the good results obtained in Graves' disease from the administration of salicylate of soda. A family history of joint-trouble was obtained in his cases.

Lemke² advocates operative procedure in cases of exophthalmic goiter on the strength of his personal experience. In 1890 he operated on 2 severe cases, and both recovered almost completely. In 1891 he operated on 3, 1 of whom died shortly after of influenza, though considerably relieved of the original trouble. The second recovered entirely; the third passed from observation. He has since operated on 3 cases with similarly happy result. The improvement he points out may be at first somewhat rapid, but is afterward slow, and does not reach the highest point until a year or two have elapsed.

DISEASES OF THE BLOOD-VESSELS.

General Symptomatology.—Verstraetin³ finds a bruit at the lower border of the liver in many cases of impressionable subjects suffering from various cachexiæ. He found it in about 6 per cent. of the persons whom he examined. Pressure on the abdomen at the umbilicus always modifies the murmur, and may completely suppress it. Another venous bruit frequently met with, especially in anemia and in tuberculous persons, is heard at the right costoclavicular articulation and in the first and second intercostal spaces, and a similar but fainter murmur may be present on the left side. The bruit heard at the border of the liver is produced in the inferior vena cava, as Trousseau and Davies pointed out in cases of cirrhosis of the liver; the murmur heard below the clavicle is referable to the innominate veins.

Piazza-Martini⁴ found in 3 cases of cirrhosis of the liver toward the end of the case, and in 1 of carcinoma of the liver with a metastatic nodule projecting into the lumen of the vena cava, a constant venous murmur in the region of the liver. This was most plainly audible in the sixth intercostal space, but sometimes as high as the fifth; it is stronger in inspiration than expiration, and sometimes disappears by paracentesis of the abdomen or chest. He regards this as produced in the vena cava, and as due to pressure upon or contraction of that vessel. Von Jaksch⁵ records a case of cirrhosis of the liver in which there was felt between the ensiform cartilage and umbilicus a peculiar thrill coincident with a venous bruit which could be plainly heard. At the autopsy great enlargement of the portal vein, of the coronary veins of the stomach, and of the esophageal veins was detected. Some of

¹ Jour. de Méd., April 10, 1895.

² Deutsch. med. Woch., No. 42, 1894.

³ Ann. de la Soc. de Méd. de Gand, 1894.

⁴ Rif. Med., No. 283, 1894.

⁵ Prag. med. Woch., No. 2, 1895.

these were so greatly dilated as to constitute veritable blood-cysts, and the murmur heard during life without doubt had this origin.

J. Mackenzie¹ contributes some interesting studies of the significance of the venous pulse. The wave appearing in the veins before the carotid pulse he regards as due to the systole of the auricle; one synchronous with the carotid pulse, as due to the ventricular systole. The ventricular wave of the venous pulse can only appear in tracings from cases of heart-disease. In functional heart-murmur the auricular wave alone is found. In cases of tricuspid insufficiency the blood regurgitates during ventricular systole, and flows into the pulmonary artery at the same time. The sudden closure of the pulmonary valves then produces a sudden increase of the regurgitating wave, which is clearly marked on the venous curve. Often this is the only part of the wave reproduced in the tracings.

Federn,² as the result of elaborate investigations extending over a considerable period, contributes some interesting observations upon the question of blood-pressure in certain general diseases, particularly in various forms of neurasthenia. As illustrative of the effect of increased blood-pressure he cites a case of a man in whom certain symptoms were regularly developed with increased blood-pressure. On one occasion, when the pressure rose to 180 mm., a sharp attack of migraine developed, and headaches, inability to work, disturbed sleep, oppression, and diarrhea occurred regularly when the pressure was from 130 to 140 mm. The observations of pressure were made with the aid of v. Basch's sphygmomanometer.

Arteriosclerosis.—A. Fraenkel³ records an interesting case illustrative of the relation of syphilis to precocious arteriosclerosis. The case in point was that of a woman of thirty-six whose husband had had syphilis, and who herself had scars on the head from old ulcerations. She first presented the symptoms of aortic regurgitation, which was thought to be rheumatic in nature. She subsequently presented herself with angina pectoris, and died in an attack. At the autopsy there was found considerable coronary sclerosis and atheroma of the aorta down as far as the bifurcation. There was also a gumma of the septum of the ventricles. Speaking of the relation of syphilis to arterial disease, Fraenkel remarks that of 19 cases of aneurysm of the thoracic aorta under his observation, 9 (47 per cent.) gave a history of syphilis, and all of these were under fifty years of age.

Stoecklin⁴ contributes an interesting report of a case of syphilitic gumma that eroded the left vena anonyma and caused death by hemoptysis. Gummata of the blood-vessel walls are rather rare, and the author therefore refers to the recorded cases of Wagner, Virchow, and Baumgarten. It is still more rare to find the cause of death to be hemorrhage from erosion of a vessel by gumma. Such a case, however, was reported before by Verneuil: in this instance the femoral artery was the one affected. Stoecklin's own case occurred in a girl of seventeen years, whose parents were

¹ Edin. Med. Jour., June, 1894.

² Blutdruck und Darmtonie. Deuticke, Leipzig, 1894.

³ Med. Record, Nov. 17, 1894.

⁴ "Eröffnung der Vena anonyma," Inaug. Diss., Kiel, 1894.

apparently healthy, but whose children died in a suspicious manner, 9 out of 12 dying within a few months of birth. A year before her admission to the hospital she had suffered with enlarged and caseous glands of the neck for which incision was required. At the admission she was found to have an enlargement of the tissues of the neck above the clavicles and in relation with the sternocleidomastoid muscle. The symptoms were those of pressure on the trachea. After a few days the sputa became blood-streaked, then a large hemorrhage occurred, and death ensued. At the autopsy gummatous involvement of the clavicles, muscles, and fibrous tissues, with erosion of the trachea and innominate vein, was discovered.

Aufrecht¹ records a most interesting case of circular atheroma of the aorta with symptoms of aortic stenosis and insufficiency. The heart was enlarged, and there was a double murmur most distinctly audible at the aortic area. Death resulted from increasing dyspnea and coma, and at the autopsy the aortic valves were found intact. The stenosis was due to a ring-shaped area of calcification and atheroma from 1 to $1\frac{1}{2}$ cm. wide. The parts of the patch corresponding to the common insertion of the leaflets projected into the artery above the other portion. The author considered the regurgitation in this case as due to the impossibility of the blood to find its way into the sinuses of Valsalva.

Aneurysm.—Puppe² details 16 cases of aneurysm of the aorta, of which 13 were in men and 3 in women. The duration from the first symptoms to the fatal end was from two to twenty-five months, the average being ten and three-tenths months. As to the etiology, 2 cases were arteriosclerotic; in 2 traumatism as well as arteriosclerosis figured. Of the 12 remaining cases, 7 presented unquestionable evidence of previous lues, and an eighth less definite evidence. In the other cases there was no evidence of a definite character, though there were certain significant indications. The relation of syphilis to aneurysm and arteriosclerosis is also referred to by Fraenkel.³ [There can be little doubt but that the views expressed are sound. Our own experience is decidedly indicative of a strong participation of syphilis in the causation of aneurysm, especially when seen in young persons.]

Bruce⁴ reports a case of aortic aneurysm which ruptured into the superior vena cava. The patient, a stone-mason of fifty-seven years, gave a history of fairly good general health, with the exception of syphilis eighteen years before. Cicatrices from old ulcers were visible on the right side and back of the tongue. He was a moderately heavy drinker. He had cough for several years, with increase during the summer of 1894. On July 31st his cough became much worse and he felt oppressed, thinking he had caught cold. There was no extra exertion on that day. The next day his face was blue, his breathing difficult. Later there were increasing blueness and edema of the face, neck, and upper extremities, as well as of the thorax, while the

¹ Deutsch. Archiv f. klin. Med., Bd. liii. p. 562.

² Deutsch. med. Woch., Nos. 45 and 46, 1894.

⁴ Edin. Med. Jour., April 18, 1895.

³ Vide supra.

abdomen and legs were unaffected. A peculiar murmur was heard over the base of the heart. This was continuous, loud, and almost musical. It was most intense during systole, and gradually died away during diastole. It was propagated mostly toward the right side. A curious point to be noted was that the murmur was heard with greatest intensity opposite the third

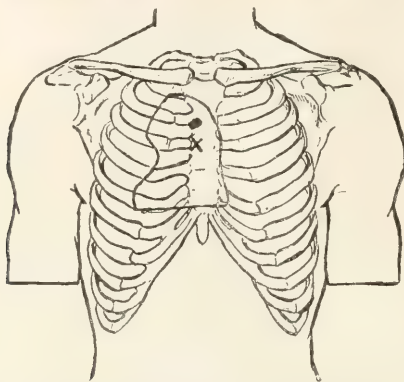


FIG. 6.—The outline bounds the area of distinct audibility of the murmur. The X shows the first, the ● the second position of maximum loudness of the murmur.

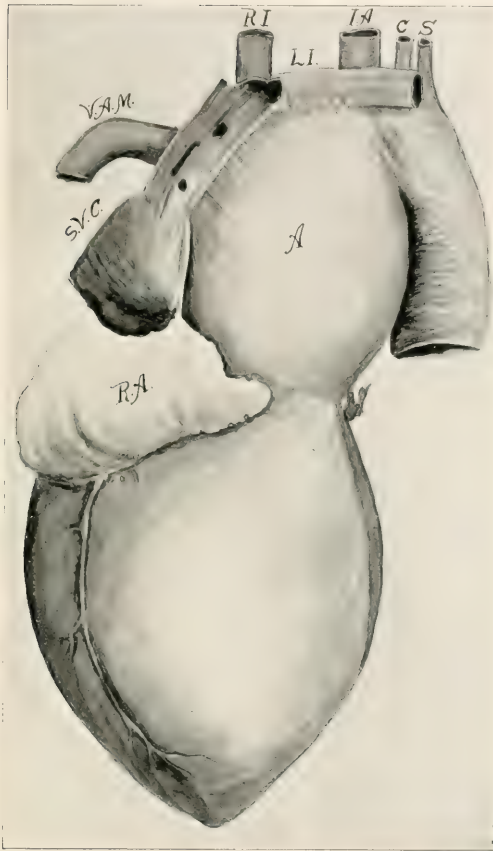
costal cartilage on one day, and opposite the second cartilage on the day following, there having been in the mean time an attack of intense dyspnea with cyanosis. This was explained by the discovery postmortem of two ruptures into the vena cava, the upper one being evidently more recent than the lower.

Glasgow¹ records 6 cases of aneurysm of the aorta in which a sound could be heard in the brachial artery coincident with the systole of the heart, such as is the case in aortic regurgitation. There was also in these cases the Corrigan pulse, and both conditions were dependent upon the emptiness of the arterial system due to the aneurysm. He believes this may be a useful indication in cases of latent aneurysm of the aorta.

Niewerth² details the clinical features in 5 cases of aneurysm of the hepatic artery collected from literature, in which accurate clinical history was given, and adds a sixth. The patient, a waiter, nineteen years old, had necrosis of the humerus. While in the hospital there was a sudden attack of imperfectly developed ileus. Soon a tumor which had the situation and characters of a distended gall-bladder developed. After three days collapse set in and celiotomy was performed. The peritoneal cavity contained considerable blood; the gall-bladder was distended with bloody bile; there was a rupture of the hepatic artery. The patient soon died. At the autopsy

¹ N. Y. Med. Jour., Sept. 15, 1894.

² "Ueber einen Fall von Aneurysma der Arteria Hepatica," Inaug. Diss., Kiel, 1894.



A., Aneurysm of ascending arch of aorta.

S.V.C., Superior vena cava, stretched over and adherent to the aneurysm, and showing the two positions of rupture, and between them the opening of the (V.A.M.) vena azygos major.

R.I., Right innominate vein.

L.I., Left innominate vein, partly adherent to the aneurysm.

I.A., Innominate artery.

C., Left carotid; S., Left subclavian artery.

R.A., Right auricle.

(Edinburg Med. Jour., April, 1895.)

there was found a large aneurysm of the hepatic artery, which had compressed the cystic duct and caused dilatation of the gall-bladder, into which it afterward ruptured, as well as into the peritoneal cavity.

Jessop¹ records the case of a man who died at the age of twenty-seven, and in whom, during four years, there had been an aneurysm in the left elbow, then of the left and right external iliac vessels, the latter being cured by a ligature, and finally one of the left internal iliac, which caused death by rupture.

Davison² details 3 cases of aneurysm of the aorta in which venesection constituted part of the treatment, and asserts that this has not merely a temporary palliative, but a decided permanent, value when combined with rest, restriction of the diet, and other well-known measures of treatment.

Thrombosis.—Hirtz³ calls attention to the occurrence of thrombosis in the veins in the earlier stages of phthisis, and believes this due to tuberculous conditions of the vessels rather than to marantic thrombosis, as is so common in the later stages. He bases this view on the investigation of Weigert, who discovered such tuberculous lesions in the veins of the chest and abdomen. In his cases of thrombosis, however, the veins involved were those of the extremities.

Althaus⁴ in an article on thrombosis in influenza states that Litten collected 25 cases of venous thrombosis chiefly affecting the femoral vein, and 8 cases of arterial thrombosis, in 5 of which the popliteal artery was involved. Leyden reports another case.

Thompson⁵ contributes a paper on thrombosis and thrombophlebitis occurring in various diseases. He has been struck by the greater prevalence of these conditions in the last several years, and asks if influenza is not accountable for this greater frequency. There have occurred 73 cases in the New York Hospital in the fourteen years from 1880 to 1894. Among these there were 4 at least in which the disease of the veins and influenza were coincident. Out of 88 cases collected from different sources, all of 12 which occurred without any accompanying disease appeared during the grippe period, and 7 of these were observed during the last year. Analyzing all of his cases, he found that thrombophlebitis occurred in connection with typhoid fever 23 times; pneumonia, 6 times; grippe, 4 times. There were 3 cases each of pleurisy and chronic nephritis, 2 each of bronchopneumonia, anemia, and appendicitis (1 septic), and 1 each of liver-abscess, pyemia, septicemia, carcinoma of the gall-bladder, endocarditis, meningitis, rheumatism, cardiac hypertrophy, gastritis, erysipelas, and ulcer of the leg. Regarding the vessel affected, of the 88 cases 63 primarily involved the femoral vein, 12 the popliteal, 5 the pulmonary, 3 the cerebral sinuses, 1 each the tibial, portal, and the veins of the neck, 2 the internal, and 1 the external iliac veins.

¹ *Lancet*, Nov. 17, 1894.

² *Mercredi Méd.*, No. 24, 1894.

³ *Med. Rec.*, April 13, 1895.

⁴ *Ibid.*, May 19, 1894.

⁵ *Lancet*, p. 1446, 1894.

Schwabb¹ reports 2 cases of thrombosis of the inferior vena cava occurring in cases of chronic renal disease, and regards the thrombosis as due to slowing of the current of blood from cardiac weakness. Some alteration of the wall of the vessel may have contributed. One of the patients, whose clinical history is given, came under observation with the signs of chronic nephritis, bronchitis, and hydrothorax. There was great enlargement of the superficial veins of the abdomen, and some pulsation of the same. Later edema of the legs developed, but there was no ascites. The liver was felt and seemed hard. Shortly before death suppurative parotitis and uremia occurred. At the autopsy there was found a large adherent and somewhat organized clot in the vena cava extending into the common iliac branches; the collateral veins were greatly enlarged. The liver was slightly cirrhotic, the kidneys contracted, and the heart dilated.

Johst² reports an interesting case of occlusion of the superior mesenteric vein by thrombosis. The patient was a woman of thirty-three years, of previous good health, who in 1890 complained of great pain in the left hypochondrium, especially after eating, and of abdominal distention. A few months later these symptoms were more marked, and a swelling was palpable under the left ribs. In June, 1892, she was delivered of a well-developed but dead child. After this pain and distention of the abdomen recurred, and were extremely severe. Soon they were so marked and loss of power so decided that she entered the hospital. There were obstinate constipation, repeated vomiting, great tympany, enlargement of the spleen, no ascites, and death in collapse. The autopsy showed thrombosis of the splenic and superior mesenteric veins; loose thrombi in the smaller mesenteric branches; great dilatation of the intestines, with hemorrhagic infarction and beginning necrosis of their walls, and infarctions of the mesentery. There was beginning peritonitis. The author abstracts the 8 previously-reported cases, all of which agree in their clinical history with his own. He believes the process began with partial obstruction of the splenic vein in 1890, and that the slowed circulation after the confinement of 1892 led to further obstruction of the mouth of the portal vein and the superior mesenteric. [An unreported case exactly resembling this, except that there was watery purging, occurred under the observation of one of the editors. In this case the cause was carcinoma of the head of the pancreas.]

Merlin³ has recorded a case of what appeared to be obstruction of the superior vena cava in which recovery ensued. A man of thirty-four after an effort was affected with swelling of the face and afterward of the whole head. The cheeks were edematous, the eyes bulged; the lips and tongue were enormously swollen, and the neck increased in circumference from 39 to 56 cm. The edema extended as low as the base of the thorax, and there were attacks of dyspnea. The jugular veins were dilated, and varicosities

¹ Inaug. Diss., Augsburg, 1894.

² "Ueber die Thrombose der Mesenterialvenen," Inaug. Diss., Königsberg, i. Pr., 1894.

³ Med. Rec., Sept. 29, 1894.

were visible at the base of the neck. There was no edema below the umbilicus. A specific history was not obtained, but the patient was treated with potassium iodid, and in a month he was discharged cured, and has since remained so (four years later).

Kockel¹ reports 2 cases of thrombosis in the lateral sinuses and veins of Galen occurring in chlorosis. In each there was severe headache followed by unconsciousness and death in a few hours, without palsy. The lateral ventricles were distended with fluid, and in one there were punctiform hemorrhages not unlike those in Strümpell's primary hemorrhagic encephalitis. Thrombosis of the lower extremities is not uncommon in chlorosis, and 3 cases are mentioned in which the pulmonary artery was affected.

DISEASES OF THE LYMPHATIC SYSTEM.

Frank² details an interesting case occurring in a woman of thirty-one years who suddenly suffered with pain in the lower part of the abdomen, and in whom on palpation a tumor of the size of a head was discovered. It was soft and elastic, fluctuating, and covered with intestines. Laparotomy was performed, and the tumor, which was retroperitoneal, was removed with considerable difficulty. It was attached to the right kidney, though it did not involve this organ. It contained 400 c.cm. of turbid yellow liquid containing cholesterin, fat drops, and leukocytes in small number. The wall of the cyst was composed of connective tissue, and not covered by epithelium. By exclusion the author concludes its origin to have been from the chyle-duct.

DISEASES OF THE MEDIASTINUM.

Gluck records a case of enlargement of the thyroid gland occurring in a girl of eighteen years, and in which gradually increasing difficulty of respiration finally led on to typical suffocative attacks. The pupil was dilated, there was mild cyanosis and inspiratory stridor, but clear heart-sounds. Both lateral lobes and the isthmus of the thyroid gland were enlarged. The jugular fossa was obliterated, and there was dulness under the upper end of the sternum. Operation was performed and the thyroid completely removed, the lower portion being drawn forward from beneath the sternum. Five minutes after recovery from the anesthetic marked cyanosis and dyspnea ensued, and with the signs of acute edema of the lungs the patient soon perished. The autopsy revealed a persistent thymus gland which covered part of the pericardium, the root of the aorta and pulmonary artery, extending far down in the anterior mediastinum, and weighing 55 g. in the fresh state.

Sansom and Tresilian⁴ record a case of mediastinal tumor which was remarkable especially from the existence of a peculiar rhythm of the heart. After a group of two or three pulsations there occurred a long pause, which

¹ Deutsch. Arch. f. klin. Med., lii. 5 and 6, 1894.

² Wien. med. Woch., No. 35, 1894.

³ Berlin. klin. Woch., No. 29, 1894.

⁴ Brit. Med. Jour., April 27, 1895.

lasted just five seconds, and was of slightly greater length than the group of three pulsations. Postmortem there was found in the posterior mediastinum a growth of a fibrous character surrounding the vagus and other structures.

Waldstein¹ in the course of his studies of the action of pilocarpin upon leukocytes was struck by the effect manifested in enlarged lymphatic glands. In one case of mediastinal and cervical lymphadenomata there was a decided decrease in size, and he recommends this remedy as possibly of service in inoperable cases.

DISEASES OF THE GASTROINTESTINAL TRACT.

DISEASES OF THE MOUTH AND THE PHARYNX.

Winkelmann² records an interesting case of chronic stomatitis, ending fatally, the nature of which remains obscure. The patient, a man forty-six years of age, had small vesicles, which later became ulcers, on the right side of the tongue. At first these were thought to be due to irritation of the teeth, but removal of the latter gave no relief. Later the ulceration extended to the angle of the mouth and the cheek. Potassium iodid had no influence, and there was no involvement of the lymph-glands of the neighborhood. The edges of the ulcers were not raised and the base was not hard. The process extended to the pharynx and larynx; bronchitis and fever, diarrhea, asthenia, and death ensued. Cultures of the scrapings showed the staphylococcus aureus and a fungus. No autopsy was performed.

Thos. Harris³ reports a case of xerostomia in a woman of thirty years in which there was complete arrest of the salivary and buccal secretions. No organic disease was discovered, and Harris regards the disease as a functional neurosis.

Cianglinski and Hewelke⁴ report a case of black-tongue occurring in a young woman. The discoloration came on very suddenly. A fungus resembling the mucor rhizopodoformis was discovered, and cultivated at low temperatures on suitable media. They cite previous cases, and a commonly accepted view that the disease is a hyperkeratosis, the fungi being mere accessories. [This may be true of some cases, but we agree with one of the reviewers of the article that there are probably various causes and different kinds of black-tongue.]

Webber⁵ reports a fatal case of mucopurulent inflammation of the fauces, tonsils, and pharynx, with general systemic intoxication, supposed to be due to poisoning by sewer gas. The child affected and others in the house had passed through what the parents called mumps, and at the subsidence of this

¹ Berlin. klin. Woch., April 29, 1895.

² Deutsch. Zeitsch. f. Chir., xxxix. H. 1 and 2.

³ Brit. Med. Jour., Dec. 8, 1894.

⁴ Zeitsch. für klin. Med., No. 6, 1894.

⁵ Lancet, p. 686, 1894.

the general symptoms and the sore throat developed. Children in an adjoining house also had occasional sore throats. A leaking cesspit was detected.

Wolberg¹ concludes from his observations that follicular tonsillitis can be communicated from person to person.

Bourges² details a most interesting instance of paralysis consecutive upon an inflammation of the throat not diphtheric in nature. This has been noted before by certain authors, but the bacteriologic proof has heretofore been wanting. The case in question occurred in a seven-year-old lad with violent membranous angina, without albuminuria, in which successive paralyses of the muscles of the right eye, of the soft palate, and of the lower extremities followed the disease. The bacteriologic examination disclosed streptococci, but no bacilli of diphtheria. The same bacteriologic discovery was made in the mother of the child, suffering with inflammation of the throat. The author points out that occasionally, after other acute general diseases like typhus and pneumonia, similar palsies occasionally occur, and that in experimental research animals injected with the toxins of streptococci and pneumococci develop palsies like those of the diphtheria-toxin.

[Regarding the relation of acute tonsillitis to rheumatism, see *Rheumatism*.]

ESOPHAGUS.

Kelling³ in reporting a case of diverticulum of the esophagus situated low down indicates some of the methods by which a diagnosis may be possible. The fact that a sound passed down—*e. g.* 44 cm.—is obstructed and is not allowed to pass after a time distinguishes from spasm at the cardiac end. If the diverticulum is emptied by vomiting or by aspirating with a special pump, and then filled with water by means of a tube while the observer auscults over the epigastrium, it may be found, as in the author's case, that the sound of the water being forced into the stomach does not occur until a certain amount has been allowed to flow into the diverticulum, filling it completely. [In his own case 280 c.cm. were required to fill the sac, and with the next 15 c.cm. the sound alluded to could be heard.] By using a Mercier's sound it is possible to pass into the stomach by directing the point of the sound away from the opening of the diverticulum.

An interesting case of varicosity of the esophageal veins is recorded by Friedrich.⁴ The patient was a girl of six years who had been weak and ill since she was two and a half years old. She had complained of pain in the region of the liver and of indigestion; had grown pale and thin, and finally, a year before she came under observation, had an attack of hematemesis, with continued vomiting and diarrhea. A year later there was a similar attack, followed by chorea, from which she slowly recovered as her strength improved. Finally, she died in another attack of bleeding. The

¹ Archiv f. Kinderheilk., vol. xvi. parts 3 and 4, 1894.

² Arch. de Méd. experimen., etc., No. 1, 1895. ³ Münch. med. Woch., No. 47, 1894.

⁴ Deutsch. Archiv f. klin. Med., vol. liii. 5 and 6, 1894.

autopsy showed extensive varicosity of the veins of the esophagus, enlargement and fatty degeneration of the spleen and liver, and a small amount of chyloform liquid in the peritoneal cavity.

DISEASES OF THE STOMACH.

Motor Disturbances and Gastrectasia.—Fleiner¹ contributes an exhaustive resume of the modern views regarding diseases of the stomach and their treatment. The view of advanced teachers that the function of the stomach is largely that of preparation for complete digestion in the intestines is sustained, and the important question for determination, therefore, is held to be that of the condition of motor activity. This is best determined by washing out the stomach some time after the taking of food. If particles of undigested food are obtained in the morning before food has been taken, the most positive proof is thereby obtained of the lack of motor activity, and the therapeutic indication—washing out the organ—at once becomes clear. Usually such an organ is dilated, and mucus may be present from associated catarrh, but there may be motor insufficiency without any dilatation or catarrh. Regarding the objections urged against the frequent use of the stomach-tube, the author points out that careful and experienced manipulation prevents any disadvantages whatever. Among thousands of personal experiences he has only once injured the mucous membrane. [Regarding the further examination and management of gastric disorders, the views expressed are those in general entertained by most authorities.]

Bourgetans² and Manges³ point out that the important function of the stomach is in reality the muscular power, and that chemie examination of the gastric juice is of minor importance. The composition of the secretion varies in different cases of the same disease, but the determination of this composition is important in connection with treatment and diet.

Wegele⁴ contributes an interesting review of the features of atonic gastrectasia, together with some personal investigations. In the diagnosis the following points are important: (a) The regular discovery of remains of food of the previous day at the morning lavage; (b) reduction of urine; (c) determination of the outlines of the distended stomach. In the treatment of the affection he recommends the method of v. Mering, of injecting water by the rectum. This supplies the necessary fluid to the tissues, increases the quantity of the urine, and improves the general tone. He uses half a liter with a half-dram of salt and a few fluidrams of cognac, injecting this mixture three times daily. Operative treatment refers to either gastro-enterostomy, or to the method of Bircher of narrowing the organ by infolding and stitching the walls. Bircher's method, according to a personal letter from the originator to the author, had been performed but 7 times, in all of which prompt recovery followed the operation. In 5 there was complete

¹ Sammlung. klin. Vorträge., No. 103, 1894.

² Wein. med. Blätter, No. 45, 1894.

³ Med. Rec., Feb. 2, 1895.

⁴ Die Atonische Magenerweiterung und ihre Behandlung. Lehman, München, 1894.

restoration of the stomach; in 1, death followed a second operation, and in this one carcinoma was suspected; in the last case death occurred from heart-failure six weeks after the operation.

Riegel¹ reports a case presenting the signs of great dilatation of the stomach in a man with a slight valvular lesion of the heart, and in whom there were no *symptoms* of digestive disturbance. He regards the enlarged stomach in this case as a congenital condition, and would apply the term Ewald suggests—*megalogastria*. Such stomachs are easily liable to atony if proper prophylaxis is not instituted. This consists in limiting the quantity of liquid food and regulating the intervals between meals to give the stomach proper rest.

Boas² in reply to Riegel maintains that it is of no importance to push inquiries regarding the size of the stomach to the extent this was formerly done. The point of importance is the determination of the motor-power of the organ. For this purpose he gives a supper of cold meat, bread and butter, and tea, and the next morning determines with the stomach-tube whether any portions of food remain. The normal and mildly atonic organ will have emptied itself completely, while the seriously atonic stomach will contain remnants, probably in a state of decomposition. The latter are rare and serious grades of the disease.

As far as the determination of the size of the organ is concerned, he points out that the tests at hand are of little value; and, moreover, a stomach normal in size may have greatly diminished motility, while an enlarged organ may be fully normal in this respect and otherwise functionally active.

Zawadski³ contributes a study of albuminous fermentation occurring in dilatation of the stomach, and reports 4 cases in which notable quantities of sulfuretted hydrogen were detected, in spite of the fact that in each there was the normal or even excessive proportion of hydrochloric acid in the gastric juice. The fermentative changes never occur before the expiration of at least twenty-four hours after the ingestion of the albuminous food. In spite of the fermentation there are no toxic symptoms, doubtless on account of lack of absorption of the products of decomposition. The occurrence of fermentation in spite of the presence of hydrochloric acid has been shown experimentally, as is indicated clinically, to be due to the prolonged retention of food in the stomach in such cases.

Boas⁴ claims that the production of sulfuretted hydrogen is relatively common in non-malignant dilatation of the stomach, whereas in carcinoma it is almost unknown. He never found it except in cases of mechanical insufficiency; it does not occur in cases of simple atony and the like. The character of the food has considerable influence, but the presence or absence of hydrochloric acid apparently very little. On the other hand, the relation of lactic-acid

¹ Deutsch. med. Woch., April 12, 1894.

² Ibid., July 12, 1894.

³ Centralbl. für Innere Med., Dec. 15, 1894.

⁴ Ibid., Jan. 19, 1895.

fermentation and the production of H_2S is very striking. They were never present concurrently.

[Further investigation is necessary to reconcile the conflicting views expressed by different writers, and it seems unlikely that Boas's positive statement that H_2S -formation is relatively unknown in cancerous dilatation of the stomach will be sustained.]

Meltzing¹ has contributed an interesting article on the study of the normal and pathologic stomach by means of electrical illumination. Among the important results of this work is the determination of the lower border of the stomach in health, which would seem to be much below the position usually assigned. He finds it almost without exception as low as the umbilicus, and when filled with water sometimes as low as the line of the iliac crests. The exact outline of the stomach as determined by him is as follows: The right end of the upper border lies at the under border of the left lobe of the liver; the left end of the same on the sixth rib in the left mammary line and in the sixth intercostal space in the anterior axillary line, from which point it runs over the seventh rib downward to the eighth, which is reached in the posterior axillary line, and from which the outline extends in an arc over the anterior end of the ninth rib to the point of the tenth. The lower border of the stomach runs from this point somewhat diagonally to a point 1 cm. below the umbilical level on the midsternal line. The right border of the stomach rises from here to the under surface of the liver. He finds that the stomach is not movable with respirations excepting in the supine position. Illumination of the stomach was further of value in the determination of the exact seat of carcinomata of the stomach.

The fact that the stomach may be almost entirely dispensed with is well shown by Langenbach,² who reports 2 cases of advanced carcinoma in which almost the entire stomach was excised and the pylorus and cardiac ends sewed together. The stomach thus constructed was about the size of a chicken's egg. In one case, after a day and a half of fever, rapid recovery ensued, and one hundred and ninety-three days later the patient was exhibited at a meeting of surgeons in perfect health. The second case died of peritonitis in six days. [This bears out the almost unanimous view of recent investigators that the glandular activity of the stomach is unnecessary to continued nutrition, and that the more important of its functions is the motor activity.]

Rose³ studied the significance of the splashing sound of the stomach, and decided that it is important for determining the lower border of the organ.

A. L. Benedict⁴ has found in his examinations that the salol-test is wholly unreliable as an indication of lack of motor power of the walls of the stomach. He tabulates 16 cases, showing the inefficiency of the test. Neither does he regard the modification of Huber, in which the time of the last trace of salicylic acid in the urine after the administration of salol is determined,

¹ Zeit. f. klin. Med., Bd. xxvii. Hefte 3 and 6.

² Deutsch. med. Woch., No. 52, 1894.

³ N. Y. Med. Jour., June, 15, 1895.

⁴ Med. News, Feb. 9, 1895.

of any practical value. He believes that the salol is decomposed in the stomach in cases of failure of active secretion.

Fodora and Corselli¹ would substitute betol as a test for the motor-power of the stomach in place of salol, claiming that the former is not decomposed in the stomach, as salol sometimes is. One gram of betol is administered, and in healthy persons the salicyluric-acid reaction occurs after from seventy to eighty minutes. In one case of pyloric carcinoma and gastric dilatation the reaction was delayed three hours and twenty minutes.

Einhorn² describes a new instrument, called the gastrograph, designed for the purpose of studying the mechanical action of the stomach. It consists of a spherical portion which is brought into the stomach, and which consists of an outer and inner wall separated by a space in which a smaller ball is allowed to move from place to place. The action of the stomach brings the outer into contact with the inner wall through the intermediation of the metallic ball within. In this way currents of electricity are made, and used to record the activity of the contractions.

Hemmeter³ has also devised an ingenious apparatus for determining the motor activity of the stomach. This consists of a stomach-shaped bag of rubber which is attached to an esophageal tube, and which may be swallowed readily. It is then inflated so as to fill the stomach accurately and to be acted upon by the motions of the walls of that organ, which are transmitted to a manometer recording the waves upon a smoked paper. Simultaneously an apparatus is attached to the abdomen which records with a separate needle the respiratory motions beneath those of the gastric peristalsis. The tracings of the needle connected with the rubber bag in the stomach exhibit small fluctuations indicating the pulsations of the aorta, and also coarser waves corresponding to gastric peristalsis.

Sensory Disturbances.—Sollier⁴ believes that the sensibility of the stomach is important in determining secretion, and therefore its functional activity. The sensitiveness of the stomach is illustrated by the sensation of hunger, by the feeling of contact of food, and by the sense of satiety. The author supports his theory by clinical and experimental evidence. The anorexia of hysteria is a clinical case in point. In such cases the author has often found areas of cutaneous anesthesia over the stomach that he thinks vary in intensity with the degree of altered sensation in the stomach itself, and that are present only when there is a feeling of hunger. Atony of the stomach he believes is a result of loss of sensation, and the author has investigated this by hypnotizing patients and suggesting the loss of gastric sensibility. He concludes, among other things, that purely nervous dyspepsias, as well as the organic forms, present modifications of the chemical processes in the stomach which depend on alterations in the secretion and movements of the organ. Ultimately all of this depends upon disturbances of sensitiveness.

¹ *Wien. med. Woch.*, 1894, No. 11.

² *Ibid.*, June 22, 1895.

³ *N. Y. Med. Jour.*, Sept. 15, 1894.

⁴ *Rev. de Méd.*, Jan., 1895.

Stockton¹ offers a very interesting argument to show the importance of functional disturbances of the stomach not only as bringing about definite symptoms, but also as determining organic changes in the later stages. He insists that functional gastric disorders usually arise from influences outside the stomach, sometimes by reflex irritation (and especially from eye-strain), sometimes by toxemia. The latter is of particular interest, and especially important is the observation that among 500 cases he found 12 in which the gastric symptoms seemed dependent upon late syphilitic toxemia. It was of interest to note that in these cases there was little disturbance in the secretion, the complaints being mainly of sensory and motor symptoms. Fully one-half of these cases failed to improve upon ordinary treatment faithfully tried, but all of them showed immediate and lasting improvement with ascending doses of potassium iodid. The author finally refers to gastric anacidity as a form of functional derangement whose long continuance is followed by organic change—atrophy of the gland.

Seltmann,² after pointing out the very great frequency of loss of appetite in children as a result of dyspeptic disturbances, reports a case of anorexia nervosa in a child of twelve years of age in which there was almost complete abstinence from food and the greatest degree of inanition. Treatment in the hospital and with feeding through a tube did not seem to give great relief, but faradization of the head was followed by surprising improvement. Daily sittings of two minutes were given and the current allowed to flow directly through the head.

Stevens³ reports a case of anorexia nervosa (with autopsy) occurring in a girl of sixteen years. After ten months of continuous anorexia there was extreme emaciation, but not the degree of loss of power nor the feeling of illness that might have been expected. No organic disease was detected. There was some improvement, but a relapse, and finally rapid death from subnormal temperature and collapse, ensued. The autopsy discovered no organic lesion.

Disorders of Gastric Secretion.—Martius,⁴ in confirmation of his view that there is a constant secretion of hydrochloric acid in the stomach, details his studies of the gastric secretion obtained from the stomachs of practically healthy men thirteen hours after the last (very simple) meal. The insertion of the sound and expression of the contents were done as rapidly and skilfully as possible, to avoid secretion from irritation of the sound. The greatest length of time consumed in the whole operation was twenty-four seconds. In 16 cases he found from 0.4 to 1.5 per cent. of hydrochloric acid, in one-half of the cases in a free state. He therefore holds that there is a constant secretion of gastric juice, and that *hypersecretio continua* is merely an exaggeration of a normal physiologic condition. Schreiber,⁵ in defending his view that there is continuous secretion of gastric juice in the normal stomach, seeks to

¹ Med. News, Dec. 15, 1894.

² Jahrbuch f. Kinderheilkunde, Bd. xxxviii., 1894.

³ Lancet, Jan. 5, 1895.

⁴ Deutsch. med. Woch., 1894, No. 32.

⁵ Deutsch. Arch. f. klin. Med., Bd. liii. H. 1 and 2.

reconcile it with the experimental observations of others. He shows that the experimental work for the most part establishes quite abnormal conditions, in that the stomach in cases in which fistulae have been made is kept perfectly clean, whereas in the normal condition of man and animals there is always a certain amount of foreign matter that has been swallowed and which is capable of exciting continuous secretion. Apart from this, however, he maintains that in some of the reported cases of investigation after the formation of fistulae other abnormalities capable of influencing secretion have been overlooked.

Debove¹ distinguishes three stages in gastro-succorhea: The first, of hyperacidity; the second, of continuous hypersecretion; and, finally, one of dilatation of the stomach with retention of its contents. In the former two stages much may be expected of treatment; in the last the prognosis is very unfavorable.

Salvioli² and Cohn³ have found experimentally that fatiguing exercise diminishes the secretion of hydrochloric acid, and the rapidity of digestion varies materially. This is certainly in keeping with all clinical experience, but Surmont and Brunelle,⁴ on the other hand, claim to have found experimentally, in a number of observations, that there is increase of gastric juice following exercise of an hour's duration, and they conclude that the stomach requires rest after a meal in cases in which there is a tendency to gastric excitement or hypersecretion, and moderate exercise where there is hyposecretion.

Savelieff⁵ in an examination of 2 healthy persons and 15 patients has found a constant absence of acetone from the gastric contents. In 1 case only was a trace discoverable. Lieben's iodoform reaction was the test employed.

Oswald⁶ found in the examination of the gastric secretion of 21 cases of chlorosis that there was hyperacidity in 18, and practically normal acidity in the remaining 3. The obvious deductions are that theories that would attribute the disease to in acidity are not well founded, and that an albuminous diet is most suitable.

Harris⁷ suggests that the dyspepsia often associated with pulmonary tuberculosis may be due to a diminished amount of ferments secreted by the digestive glands, which have been shown in some cases to share in the general wasting process.

Friedenwald⁸ states that the estimation of the rennet-zymogen is of great diagnostic importance in gastric disorders with absence of free hydrochloric acid. If the zymogen is markedly diminished or absent, there is organic change in the stomach-wall, either inflammatory or neoplastic.

Wagner⁹ in an analysis of 216 cases of gastrointestinal disease found 39

¹ *Méd. moderne*, Feb. 23, 1895.

² *Arch. italiano di Biolog.*, xvii.

³ *Deutsch. Arch. für klin. Med.*, xliii.

⁴ *Compt. rend. de la Soc. de Biol.*, No. 28, 1894.

⁵ *Berlin. klin. Woch.*, 1894, No. 33.

⁶ *Münch. med. Woch.*, Nos. 27 and 28, 1894.

⁷ *Lancet*, Nov. 10, 1894.

⁸ *Med. News*, June 22, 1895.

⁹ *Wratsh*, 1894, No. 20.

in which there was no hydrochloric acid. Of these, 6 were carcinoma of the stomach. Of the remaining 33 cases, he found in 5 a return of the hydrochloric acid after one to three months. In 14 cases but one examination was made, so that the question of return could not be decided. The remaining 14 showed a repeated absence of free hydrochloric acid. He would divide the cases into two classes: 12 cases of anacidity with apepsia, in which the reaction is neutral or alkaline, and in which neither hydrochloric acid nor pepsin is secreted and albumin is not digested; and second, 21 cases of hypoacidity and achlorhydria, in which the stomach-contents are acid and contain peptones, but in which hydrochloric acid is very much reduced or not at all present; pepsin-secretion, however, continues.

Gastritis.—Rosenheim¹ reports under the name of gastritis gravis a case which was regarded as one of carcinoma of the stomach. A woman fifty-eight years old had headache, anorexia, and later vomiting, ten weeks before admission. In the course of two weeks exhaustion was so marked that she took to bed. Headache, slow speech, dyspnea and palpitations, and progressive emaciation developed. A resistance was felt over the stomach, which was displaced and dilated. The motor activity was enfeebled, the gastric contents were disagreeable in odor, and contained no hydrochloric acid, though lactic acid was present. Slight fever, and later albuminuria without casts, developed, and emaciation continued until death, four months after the first symptom. At the autopsy carcinoma was not detected, but the stomach was dilated and the pylorus thickened. The latter was due to increase of the muscular layer. Microscopically, infiltration and interstitial hyperplasia, leading to compression of the glands and degenerative changes in them, were found in the mucous membrane. The morbid process was most marked at the fundus, while at the cardiac end the mucosa was thin and the glandular structure completely wanting.

Boas² describes as gastritis acida certain cases of gastric disease attended with hyperacidity. That these cases are instances of real gastritis, and not mere functional disorders, was proved by the fact that in two instances he was able to demonstrate the inflammatory condition of the mucous membrane in sections cut from small bits obtained in washing out the stomach. These cases, he finds, are most frequently dependent upon abuse of alcohol, tobacco, or purgative remedies. Irregular mode of life and bolting of food are contributing causes. The subjective symptoms are those of chronic dyspepsia, to which should be added severe pain and heartburn; vomiting was only noted at the time of acute exacerbations. The appetite was very variable. In the examination of the patient the absence of positive signs is most characteristic. There may be a little tenderness in the epigastrium, but nothing more. The stomach-contents were found to contain considerable mucus and excess of hydrochloric acid. It may be impossible to distinguish this condition from mere functional hyperacidity unless portions of the

¹ Berlin. klin. Woch., No. xxxix., 1894.

² Wien. med. Woch., Jan. 5, 1895.

mucous membrane are obtained by inserting the tube. Finally, Boas inclines to view this condition as one of the stages merely in chronic gastritis.

Gastric Ulcer.—Einhorn¹ reports a number of cases of patients presenting emaciation, weakness, pain in the stomach, and in whom on washing out the stomach small bits of blood-red mucous membrane were discharged. Such cases the author inclines to regard as instances of superficial erosion of the mucous membrane. He does not think that the introduction of the tube caused the separation of the portions of membrane because of the regularity with which the occurrence was noted in certain patients and the fact that a soft tube was used with great care. In the treatment of these conditions he has devised an apparatus by which astringent or other remedies may be sprayed directly upon the mucous membrane. [There must remain a certain amount of doubt as to the nature of the cases described. We have ourselves had patients in whom the most careful use of the stomach-tube caused injury of the mucosa, but we are not by any means convinced that this was not the result of an inflammatory condition of the surface, rather than actual erosion.]

De Rochemont² reports a case that shows that gastric ulcer is not of necessity dependent upon excess of hydrochloric acid. The patient was a woman of thirty-eight years. The autopsy in this case revealed two separate lesions of the stomach—one a carcinoma which was ulcerated and perforated, the other a typical gastric ulcer so situated as not to have come in contact with the carcinomatous area, and presenting no evidence microscopically of carcinoma. Clinically there had been for a year gradually increasing gastric disturbance, which might very well be accounted for by the carcinoma; and more latterly acute pain and more active symptoms, explainable by the discovery of the ulceration. There was lactic acid, but only a trace of hydrochloric acid. The microscopic examination showed a thrombus in the small blood-vessel at the base of the ulcer, and very properly the author looked upon this as the cause. It in turn may have been dependent upon local or general conditions resulting from the carcinoma.

A valuable statistical paper is contributed by Stoll³ on round ulcer of the stomach, based upon 3476 autopsies at Zurich. Among these, ulcers in the fresh state, or healed as evidenced by scars, were determined in but 75—that is, in 2.16 per cent. of the cases—which corresponds closely to Berthold's figures, but falls far short of those of other observers. The majority of cases occurred within the fifth decade of life. In 2 cases affecting man and 4 affecting women gastric and duodenal ulcers coexisted. Among the 75 cases scars were detected but 8 times, scars with ulcers 6 times, and gastric and esophageal ulcerations in 2. It was noticeable that the number of cases occurring in women did not outnumber those in men as largely as statistics in general would indicate. An interesting point in regard to women was the fact that in 25.5 per cent. of the cases there was a decided pressure-atrophy

¹ Med. Rec., June 23, 1894.

² Münch. med. Woch., No. 50, 1894.

³ Deutsch. Archiv f. klin. Med., Bd. lili. H. 5 und 6.

of the liver, due to lacing. Counting 4 cases in which the ulcer became carcinomatous, 20 per cent. of the cases were fatal, of which 11 were due to perforation, and the rest to hemorrhage, intercurrent diseases, and gradual exhaustion. In 27.7 per cent. of the cases the disease was latent. Regarding the gastric juice, he found that of the 30 cases in which this was examined carefully, 20 per cent. failed to show free hydrochloric acid; and, contrary to the usual belief, it was found that the absorption from the mucous membrane of potassium iodid was delayed.

Pick¹ reports a case of perforation of the diaphragm by gastric ulcer, and analyzes 28 cases recorded in literature. In 20 of these the rupture was direct; in 8 indirect, following subphrenic abscess. The rare ulcers of the fundus are most likely to terminate in this way, and in all cases the existence of old adhesions strongly favors thoracic rupture. In 9 cases the left pleura was affected; in 7, the left pleura and lung; in but 1 (following subphrenic abscess), the right pleura; the pericardium was entered in 6, the heart and pericardium in 4, the mediastinum once, and the anterior thoracic wall in the author's case. The immediate cause of rupture was generally some mechanical distention. Death was usually due to complications, and not to shock. In cases of perforation of the heart, death was delayed as much as three or four days in some cases.

Cohn² contributes an interesting report of a case which he regarded as one of perforation of a gastric ulcer which went on to recovery under expectant treatment. The diagnosis was in considerable doubt, however, on account of an epidemic of cholera which was raging at the same time. The symptoms might easily have been interpreted as indicating the algid stage of cholera. The sharp localization of the pain and the clinical course led the author, however, to speak of it as a case of perforating gastric ulcer. A very remarkable feature is the fact that the woman was in the ninth month of pregnancy, and that a month later she was delivered of a mature and healthy infant, and continued to improve in her own health.

Savelieff³ details results of the treatment of gastric ulcer after the method of Fleiner. He administered 10 g. of bismuth in 200 of warm water on an empty stomach, and then allowed the patient to drink several swallows of water, after which he was placed in a horizontal position with elevated hips for about an hour. He does not conform to Fleiner's use of the sound for drawing off the excess of water from the stomach after the mixture has been administered. He found that about 200 g. of bismuth administered in the manner indicated usually sufficed to effect a cure. In 11 cases thus treated the results were excellent. There was never obstinate constipation induced by the bismuth, and the symptoms were rapidly improved.

Rankin⁴ records 10 cases in which there were characteristic symptoms indicative of gastric ulcer, and which were treated by a combination of papain, iron, and cannabis Indica with excellent effect. The first-named

¹ Zeitsch. für klin. Med., Bd. xxvi. H. 5 und 6.

² Therap. Monatsheft, May, 1894.

³ Ibid., Oct., 1894.

⁴ Lancet, Feb. 9, 1895.

remedy is most important from its power to aid in healing and from its solvent action upon unhealthy tissue; cannabis Indica is a useful sedative to the stomach, and a nerve-tonic as well; while the iron is generally indicated for anemia. The remedies are combined in pill form, the quantity varying according to the demands of the case. The author suggests that very many cases of irritative dyspepsia may in reality be instances of ulcer, unquestionable indications, however, failing to be developed. The happy result of the same treatment in such cases he thinks an indication in favor of this view.

Carcinoma of the Stomach.—*Diagnosis.*—Boas has claimed that the presence of lactic acid in the gastric contents is a constant condition in carcinoma of the stomach and constantly lacking in other diseases. His first contribution was made some time since, but recently he¹ again insists on the absence of lactic acid from the gastric juice in health and in diseases other than carcinoma. In normal persons he holds that it is not present at any stage of digestion. It was not found in 5 cases of chronic gastritis, 5 cases of atony, and 6 cases of nonmalignant dilatation. In 13 out of 14 instances of gastric carcinoma the acid was present in rather large quantity. In 4 of these it was found before there was a palpable tumor. The absence of lactic acid is not as absolutely significant as its presence, since there are occasional cases of carcinoma in which it does not occur. In these recent investigations he has always used a flour-soup test-meal recommended in his previous papers to obviate the error due to the presence of lactic acid in the ingested matter, and he has also used his own test, which appears to be more delicate and reliable than the older ones.

[That this observation of Boas is one of importance is scarcely to be doubted, but it is very questionable whether this test will be found to have the pathognomonic importance sometimes attributed to it. Boas himself² in a further article on the occurrence of lactic acid in the stomach, while repeating that it is of the greatest significance as indicating carcinoma, at the same time admits its presence in traces in cases of various kinds of gastric disorder with or without the presence of hydrochloric acid, and in which the motor activity may be preserved or completely lost.]

A number of authors have contributed reports confirming Boas's views, and some would give even greater significance to the test than Boas himself.

Conti³ was unable to find lactic acid in cases of simple atony or dilatation, or in mechanical dilatation following stenosis of the pylorus, and, like Boas, therefore concludes that the absence of hydrochloric acid and fermentation is not alone sufficient to produce this acid.

Oppler⁴ substantiates the observations of Boas regarding the significance of lactic acid as an indication of carcinoma of the stomach. From this standpoint carcinoma may be separated into the following groups: 1. Those in which lactic acid is abundant, and in which there is absence of free hydrochloric acid and reduction of the motor power. Sarcinæ are abundant in these cases. 2. Lactic acid is found in the cases in which the motor func-

¹ Zeitsch. für klin. Med., 1894, H. 3 u. 4.

² Berlin. klin. Woch., No. 9, 1895.

³ Gaz. degli Osped. et delle Clin., May 26, 1894.

⁴ Deutsch. med. Woch., Jan. 31, 1895.

tion is normal and hydrochloric acid absent. Sarcinae are absent. 3. Lactic acid is never found when there is hydrochloric acid and the motor function is disturbed. Sarcinae are, however, present in such cases.

Cohnheim¹ also confirms the value of the recent methods of Boas for the detection of lactic acid in the stomach-contents, and the clinical significance of this as an early sign of carcinoma.

Friedenwald² in an examination of healthy and diseased persons according to the recent methods of Boas found the following: (1) Lactic acid was completely absent in 8 normal individuals; (2) in 4 cases of superacidity; (3) in 2 cases of simple dilatation; (4) in 8 of chronic gastritis; (5) in 4 of secondary gastric catarrh; but (6) a trace was found in 1 of 8 cases of atony; and (7) in 4 cases of carcinoma lactic acid was present in considerable quantity, and discoverable alike by Boas's as by Uffelmann's tests. The trace found in 1 case of atony may be explained, as Boas points out, by a swallowing of saliva.

There are other observers, however, who do not confirm the views of Boas, or at least who do not go to equal lengths with him and his followers. Klemperer³ does not admit the pathognomonic significance of lactic acid in the gastric secretion. He regards it rather as indicative merely of mechanical retention of food and fermentation. Among 15 cases of carcinoma of the stomach in Leyden's clinic 3 did not present lactic reaction. [Nevertheless, the sign is of value as an aid to diagnosis.]

Bial⁴ records a case of ulcer of the stomach with atrophic gastritis, narrowing of the pylorus, and dilatation of the stomach, in which there was absence of free hydrochloric acid and the presence of lactic acid, both according to the recent test of Boas and the older Uffelmann reaction. The case was regarded as one of carcinoma, and the correct diagnosis was made postmortem. The author refers to other cases in which lactic acid has occurred in the absence of carcinoma, and therefore claims that Boas has gone too far in asserting pathognomonic importance for this test. In answer to Boas's criticism of his previous report of the case of ulcer of the stomach in which he claimed to have found lactic acid, Bial⁵ asserts that all proper precautions necessary for accuracy had been taken, that the stomach was being washed regularly, and that repeated examinations were unnecessary in view of the positive result obtained.

Seelig⁶ also holds that the procedure of Boas for the diagnosis of carcinoma of the stomach in its early stages is unreliable, though he looks upon the introduction of a test-meal free of lactic acid as a distinct advance, using Uffelmann's reagent to determine the existence of lactic acid. With this test he obtained a positive result only in cases of carcinoma.

Strauss⁷ has studied the question of lactic-acid formation, and of fer-

¹ Deutsch. med. Woch., No. 20, 1894.

³ Centralbl. f. Innere Med., Feb. 9, 1895.

⁵ Ibid., March 11, 1895.

² N. Y. Med. Jour., Mar. 23, 1895.

⁴ Berlin. klin. Woch., Feb. 11, 1895.

⁶ Ibid., No. 5, 1895.

⁷ Zeit. f. klin. Med., Bd. xxvi. and xxvii.

mentation with evolution of gases, very extensively. For the detection of lactic acid he used the Uffelmann test, and for the detection of gaseous fermentation the fresh unfiltered contents of the stomach were placed in Ewald's tubes and kept in an oven for twenty-four hours at 37°. These investigations show that lactic acid is present in the majority of cases of carcinoma, though also in some cases of marked reduction of the chemical and motor power of the stomach without carcinoma. Among the latter he found it in some cases of chronic gastritis, gastropotosis, and rarely in secondary gastric disturbances occurring in other diseases.

Gaseous fermentation occurs in the stomach both in the presence and the absence of hydrochloric acid, and indeed is more common and intense in cases in which there is free hydrochloric acid. It was very decided in cases of dilatation of the stomach, and was present also in carcinoma, gastropotosis, and secondary diseases of the stomach. It was rare in ulcer, neuroses of the stomach, and chronic gastritis. The gas in question is for the most part carbon dioxide, and there is also a certain amount of hydrogen. The occurrence of lactic acid is suggestive of carcinoma, but by no means pathognomonic.

Manges¹ in a paper on the early diagnosis of carcinoma of the stomach, especially with reference to Boas's recent investigations, holds that so far as can be definitely stated at present the presence of large quantities of lactic acid is due to stagnation of the stomach-contents and the absence of free hydrochloric acid, which offer very favorable conditions for the rapid growth of the lactic-acid bacilli. Regarding the test for lactic acid, he believes that with proper precaution respecting the cleansing of the stomach and the giving of a proper test-meal Uffelmann's reaction will suffice, provided the reaction is well marked, and points out that Pariser comes to the same conclusion, and that Boas himself admits the applicability of this test, provided an intense lemon-yellow color is obtained after adding only a few drops of the filtrate of the gruel, or, still better, its ethereal extract.

Babes and Stoicesco² record 3 cases in which the diagnosis of internal malignant tumor was made by the microscopic examination of small nodules occurring in the skin. In 2 of the cases the disease was carcinoma; in the other, sarcoma. [A number of similar observations have been made in cases of carcinoma of the stomach, and we have ourselves been able to confirm the diagnosis in an obscure case in this manner.]

Symptoms and Complications.—Osler³ records a case of carcinoma of the stomach in which the acute symptoms antedated death by only two weeks. The patient had suffered with dyspepsia for many years, and rather more severely during the last eighteen months of life, but there was no emaciation and no definite symptoms. Quite suddenly he began to suffer with intense and uncontrollable vomiting, and died in two weeks. The vomited matters were offensive—sometimes quite fecal in odor—and contained fragments of

¹ N. Y. Med. Jour., April 27, 1895.

² Progres mcd., 1895, No. 8.

³ Univ. Med. Mag., Jan., 1895.

neerotic tissue. Postmortem a diffuse infiltrating carcinoma was found, and an area of sloughing was seen on the lesser curvature.

Archad¹ reports a case of carcinoma of the stomach in which an intra-abdominal abscess was formed and discharged through a fistula at the umbilicus. Finally, secondary nodules of carcinoma in the liver were formed, and death followed from purulent peritonitis. The latter developed gradually without noteworthy symptoms, and was supposed to be due to an extension from suppurating nodules in the liver rather than from the purulent collection at the umbilicus.

Schneyer² has examined 30 cases of carcinoma and ulcer of the stomach in relation to the question of leukocytosis of digestion. In the 18 cases of carcinoma there was a constant absence of leukocytosis. In the 3 cases of stenosis and 7 of ulcer of the stomach there was a prompt occurrence of leukocytosis. A single case of ulcer with marasmus showed no increase of leukocytes after the meal. The author believes that the absence of leukocytosis in carcinoma is due to the disturbance of the resorptive power and of the peptonization of albumin, and possibly to some disturbance of the lymphatic apparatus.

Schule³ has analyzed 198 cases of carcinoma of the stomach, in 65 of which autopsy was performed. Regarding the closer examination of the gastric functions, he calls attention to the fact that the motor activity may be seriously impaired even though the pylorus is not invaded. Such was the case in 7 of 53 patients. In a few, however, hypermotility was noted. With regard to the hydrochloric-acid test, he found among 88 cases complete absence of free acid in 73, the presence of free acid in 10, and variable presence and absence in 5. In a few cases he investigated the *hydrochloric insufficiency* (Honigsmann), which is determined by the addition of normal hydrochloric-acid solution until Gunzberg's reaction is obtained, and found in 7 that a decidedly large quantity of hydrochloric acid is required as compared with instances of chronic dyspepsia, gastritis, and the like. Lactic acid was determined by Uffelmann's test as well as Boas' method. This substance was found only in cases of carcinoma, but the author very wisely remarks that mere chemical investigation does not suffice to determine the presence or absence of carcinoma.

Rosenheim⁴ details two cases of carcinoma of the stomach in which gastroenterostomy was performed, with studies of the function of the stomach after that operation. In both the motor power increased decidedly, though not becoming normal, but the secretory function continued to grow worse. In a third case of cicatricial narrowing of the pylorus the secretory as well as the motor function of the stomach became completely normal after four months. In this case there had been excessive flow of gastric secretion, which ceased after the operation.

¹ Méd. moderne, No. 79, 1894.

³ Münch. med. Woch., Sept. 18, 1894.

² Internat. klin. Rundschau, J. viii, No. 39.

⁴ Berlin. klin. Woch., No. 50, 1894.

Imrédy¹ records a study of the functions of a stomach in which there had been pyloric stenosis and great dilatation, and for which pylorotomy had been performed. There was demonstrable decrease in size of the organ, and all the functions were well performed. The only marked abnormality was the delay of the salol test for three-quarters of an hour. This he ascribes to the persistence of excess of hydrochloric acid, in consequence of which there was probably spasmodic closure of the pyloric orifice. That some part of the sphincter of the pylorus had been left was evidenced by the fact that bile and gases were prevented from entering the stomach from the intestine.

Treatment.—[The drug-treatment of gastric disorders has fallen into comparative disuse, and there is a tendency—excessive, it seems to us—to dwell largely upon the mechanical methods. Lavage is a procedure so strikingly useful in many cases that it has been greatly abused; and in addition the treatment of gastric disorders has become so local that authors quite generally lose sight of the bearing of the general condition upon the gastric diseases.] Pugliese² has found in the investigation of 4 cases of excessive secretion of gastric juice that atropin exercises a marked restraining influence on secretion. The amount of hydrochloric acid was decidedly diminished by the drug.

Dubs³ finds that chloroform in small doses augments the action of the pepsin in acid solution, whereas larger doses delay the same.

Hirsch,⁴ in studying the action of papain, finds that it is capable of acting in an alkaline medium, though the presence of hydrochloric acid hastens its action. Lactic acid retards it decidedly. The power of papain to digest albumins in neutral or alkaline medium is, however, a limited one, and the indications for its use may be taken to be instances in which the administration of hydrochloric acid in sufficient quantity to aid digestion by pepsin is not feasible, and in cases of complete absence of hydrochloric acid. In the latter pancreatin also is useful.

The advantage of papain as a digestant, that it will act in either an alkaline or acid medium, has commended it to careful trial. Younger,⁵ among others, has found it most useful in his out-patient practice. It seemed to him to be specially useful in uncomplicated cases of atonic dyspepsia.

Frazer⁶ found potassium bichromate a useful drug in cases of chronic gastric diseases with distress, and also in cases of ulcer. He attributes this happy action to the antiputrefactive power of the drug and to its analgesic action.

Bergmann⁷ calls attention to the fact that patients with acid dyspepsia often find relief after eating, and believes this due to the neutralizing effect of the saliva. He has therefore been led to adopt a plan of treatment which

¹ Wiener med. Presse, No. 13, 1894.

² Semaine méd., 1894, p. 254.

³ Virchow's Archiv, Bd. cxxxiv. H. 3.

⁴ Therap. Monatshefte. Dec., 1894.

⁵ Lancet, April 27, 1895.

⁶ Ibid., April 14, 1894.

⁷ Berlin. klin. Woch., Feb. 11, 21, 1895.

consists in the chewing of a lozenge with which ginger or calamus-root and magnesia and ammoniomagnesium phosphate are added to stimulate the flow of saliva on the one hand and to render it more alkaline on the other.

Einhorn¹ has devised an apparatus for applying liquids in the form of a spray to the interior of the stomach. The stomach is first washed out with lukewarm water. In cases of gastric erosion a solution of silver nitrate (1 to 2 per mille) is employed. As an adjuvant to this treatment he advises introgastric electricity.

Benedict² makes a further report on the use of the menthol-spray through the stomach-tube, and advises its use in fermentative, painful, or catarrhal conditions of the stomach.

Rare Tumors of the Stomach.—Ziegler³ records a case of traumatic cyst in the wall of the stomach. The patient had been severely contused between two cars. Three weeks later he suffered pain and discovered a localized pulsating mass high up in the abdomen. As this increased, vomiting, and often symptoms suggesting ileus, developed. The size of the tumor varied; usually it was about that of an apple. By exploratory puncture three-quarters of a liter of dark blood were removed, after which the tumor disappeared, but the pain continued. The tumor later reappeared. At the operation a well-distended mass with healthy peritoneal covering was discovered on the anterior wall of the stomach. No adhesions existed; liver and spleen were free. Three liters of brownish liquid were aspirated and the mass collapsed. The wall of the cyst was from 2 to 3 cm. thick, and not nodular. The patient recovered. After nine months no tumor was discoverable even with a distended stomach, but colicky pains occasionally follow indiscretion in diet. The case has no analogue apparently in medicine, and is probably an instance of the separation of the mucosa from the muscularis by traumatic hemorrhage.

DISEASES OF THE INTESTINES.

Colitis.—Hale White⁴ in an article on colitis distinguishes three forms—the simple, the membranous, and the ulcerous. The latter is usually of rapid progress—leads to decided disturbances of the general health, to dejections containing considerable blood and little mucus, though occasionally necrotic or gangrenous particles. There is irregular fever, and death ensues from exhaustion or perforation with peritonitis. Dysentery is distinguished by the different character of the discharges, by the greater tenesmus, and the greater frequency of diarrhea.

Mathieu⁵ recognizes three forms of mucomembranous colitis: (1) the mild variety, characterized by alternation of constipation with the passage of glairy mucous stools; (2) a typhoid or dysenteric acute form, marked by pain, tenesmus, mucous and bloody stools, and membrane; and (3) a chronic

¹ Med. Rec., June 23, 1894.

² Int. Med. Mag., Sept., 1894.

³ Münch. med. Woch., No. 6, 1894.

⁴ Lancet, March 2, 1895.

⁵ Gaz. des Hôpitaux, p. 1159 et seq., 1894.

and irregular form, characterized by mucous and membranous stools, with abdominal distress and disturbance of the general health. The first requisite in the treatment is to combat the constipation, which is mainly dependent upon atony and spasm of the intestines, then the use of local measures, such as the injection of water, oil, or solutions of silver nitrate or other astringents; and finally, the proper regulation of the diet.

Ulceration of the Intestines.—Hale White¹ points out the frequent association of chronic interstitial nephritis and ulcerative colitis. Among 23 cases of the latter, nephritis was found in 6, and in 2 there were gouty deposits about the joints.

Bannatyne,² in referring to the discussion at the Royal Medical and Chirurgical Society, in which Dickinson reported one form of intestinal ulceration of hemorrhagic character secondary to kidney trouble, and Hale White another form truly inflammatory under the same circumstances, reports 2 cases, 1 of which belongs to the former group, the other to the latter. Footh³ also reports 2 cases in which the association of nephritis and intestinal ulcers was confirmed.

Perry and Shaw,⁴ in analyzing nearly 18,000 autopsies with reference to duodenal disease, found 12 in which duodenal ulcers coexisted with Bright's disease, and to these they add 4 from outside sources. In one of these cases there was an apparently indisputable relation between the nephritis and the ulcerative process. A man thirty-six years old, after twenty months' illness, entered the hospital with albuminuria and diarrhea, blood having been present in the dejections. Three days later the patient died, and at autopsy marked "cirrhotic change was found in the kidneys and the heart was hypertrophied." Ulcerated areas, such as are found in Bright's disease, were found all through the large and small intestines, and the lower part of the duodenum was involved in the process, which shows the possibility of the extension of enterocolitis of Bright's disease as high up as the duodenum. According to the authors, about 7 per cent. of all persons die of nephritis, and as over 15 per cent. of their cases of duodenal ulcer showed associated nephritis, they believe some causal relations exist.

Maragliano⁵ reports 3 cases of perforating ulcer of the intestines in which neither typhoid fever nor tuberculosis existed. In the first a strong man took a purge on April 23d. After this there were dyspeptic symptoms, and on May 5th vomiting with a fecal odor. Fibrinopurulent peritonitis developed, and the autopsy showed ulcers in the ileum, two of which had ruptured. The second case was of a man who had abdominal pains occasionally for years. Shortly before his death these were very severe, and distention occurred. At autopsy an ulcer was found in the ileum. Pseudomembrane covered it, so that escape of feces was prevented. In the third case, a young

¹ Lancet, March 2, 1895.

² Edinburgh Med. Jour., Aug., 1894.

³ London Path. Soc., Jan. 16, 1894.

⁴ Guy's Hospital Reports, 1893; Am. Jour. Med. Sci., April, 1895.

⁵ Berliner klin. Woch., March 26, 1894.

man after an error in diet had vomiting, constipation, and distention. Later peritonitis developed, and at operation a perforating ulcer was discovered. Bacteriologic examinations revealed an organism similar to the *B. coli communis*. The author regards these as instances of intense enteritis with ulcerations, and refers to similar cases occurring at the same time. [Curiously enough, he does not mention intestinal anthrax in considering the general subject of ulceration of the intestines.]

Zörkendörfer¹ reports a case of primary intestinal anthrax occurring in a man who had four days previously worked with the hides of two cows which had died with the disease. There was no sign of external anthrax, and the intestinal lesions were evidently the most advanced found in the body, so that there is little doubt but that his view that the infection was primarily gastrointestinal is correct. The bacilli were found in the blood and organs, but in especial number in the intestinal lesions. (See *Anthrax*.)

Appendicitis and Typhlitis.—[The opinion is unquestionably growing that these are for the most part surgical diseases, and to be treated by surgical measures, but it is also quite clear that some of our American surgeons in particular are too radical. Medical treatment has still its place, and medical men must continue to have special interest in these affections, on account of questions of diagnosis if for no other reason.]

The discussion regarding typhlitis held at the Congress for Internal Medicine at Leipzig² developed, among other facts, that German physicians for the most part are still conservative in regard to operative treatment in appendicitis. Sahli denies the existence of stercoral typhlitis as a common condition, and would restrict the disease of the right iliac fossa to appendicitis and periappendicitis. These inflammations result always from retention of irritating material in the cecum. He asserts that in every case of typhlitis as soon as a palpable tumor is developed, purulent infection and formation may be assumed. The spontaneous recovery in such cases is to be ascribed to resorption of pus, and also to spontaneous discharge of the abscess. In regard to treatment, he advocates at first rest and opium, with entire abstinence from food. After three days, or at most eight days if there is no decided subsidence, operation is imperative. Further indications for operation are any of the well-known signs indicative of pus. Helferich was inclined to a more advanced view regarding the advisability of operation, but is far from radical. He asserts, however, that in doubtful cases it is always better to be able to say, "The patient might have recovered without operation" than to say, "The patient might have been saved by operation." Sonnenberg contended mainly for greater precision in distinguishing simple appendicitis, which is benign in nature and prognosis, from perforative and suppurative forms. The latter, he maintains, are distinguishable by their sudden and violent onset, their decided chills and fever, and unfavorable prognosis. His position regarding operation is more radical than that of other Germans. Kurschmann stated that in 452 cases seen by him in recent years

¹ Prager med. Woch., 1894, No. 16.

² Centralbl. f. Innere Med., May 25, 1895.

the mortality was 5.4 per cent. He denies the view of Sahli that all cases of enlargement about the cecum and appendix are due to purulent infection, claiming that ordinary serofibrinous exudations also occur, and the tumor is further augmented by retention within the intestine and infiltration of the surrounding parts. He holds to the existence of inflammatory troubles from ulcerations in the cecum, though the latter may be rare. Stintzing also controverted Sahli's view regarding the purulent nature of all cases of perityphlitis.

At a meeting of the Société médicale des Hôpitaux, Millard¹ urged the medical treatment of appendicitis and perityphlitis almost to the exclusion of surgical measures. The physicians present were all favorable to this view. It was deemed of especial importance to distinguish between perityphlitis of stercoral origin and appendicitis. Moizard observed that typhlitis is rarely met with in children, in whom he would therefore recommend operation with little hesitation. Opium to immobilize the bowel was recommended for appendicitis; purgation for typhlitis. Rendu states that the immense majority of cases of perityphlitis recover under medical treatment. Ferrand thinks that belladonna would prove more useful than opium to quiet peristalsis, because it tends to check the secretions much less.

Lennander² in a monograph describes 68 cases of appendicitis, particularly with reference to the indications for operation. He insists upon absolute opium-treatment at first. Operation should be performed at the onset if this is extremely severe or if the typical improvement of benign appendicitis under the opium treatment does not ensue.

Oppenheim,³ in an answer to a criticism of Sonnenberg's work upon appendiceal troubles, maintains that the statistics of clinicians who assert that from 75 to 95 per cent. of all cases end in recovery under medical treatment are not, as a rule, obtained by physicians. Among his own cases there were 16 in which operation was not performed. Of these, 5 died (he includes here 3 cases in which laparotomy was performed in extremis at the earnest request of friends of the patients); 3 cases ended with a discharge of the pus by rupture into neighboring organs, once in the bladder, twice in the intestines; 2 cases were discharged cured of the relapsing attack for which they were admitted, and 6, of which 3 were doubtful in diagnosis, recovered. In 11 cases operation was performed, and all recovered and have presented no relapse after intervals of from two to four years. [This very remarkable statistical evidence is certainly unusual so far as the untoward results of expectant treatment are concerned, and most satisfactory as regards his own operative experience and that of Sonnenberg, who operated for him. It is far too one-sided and unusual to have much weight.]

Yeo⁴ records a case which he regards as one of rheumatic perityphlitis. The patient, a young girl of eighteen years, had rheumatism in November. The following April she was admitted to the hospital with stabbing pains in

¹ *Gaz. des Hôpitaux*, Dec. 11, 1894. ² *Ueber Appendicitis*, Wien, 1895, W. Braumüller.

³ *Deutsch. med. Woch.*, July 12, 1894.

⁴ *Brit. Med. Jour.*, Jan. 16, 1894.

the right iliac region, vomiting, and extreme constipation. She also had pains in the knees and arms. There was local resistance in the right flank. A systolic apex-murmur was heard. The temperature was 102.8° on admission, but declined after a dose of castor oil had acted thoroughly. The day after, however, it suddenly rose to 105° , and persisted for some days. Rheumatic swelling of the right knee occurred. Salicylate of soda secured a decline of the temperature and relief of the joint-symptoms. A grating friction could be felt in the iliac fossa on gentle palpation. Subsequently the temperature again rose to 104.4° , and again declined critically after exhibition of salicylate of soda. Convalescence was rapid and complete. No other treatment likely to have influenced the case was used. [There is doubtless here considerable justification for the author's suspicion that this was an instance of rheumatic local peritonitis, but in view of the recent investigations concerning rheumatism it may not be amiss to ask whether this was not possibly an instance of rheumatism secondary to an intestinal lesion which had occasioned general infection.]

Intestinal Atony.—Friedenwald¹ has investigated the method suggested by Boas for the detection of intestinal atony in 40 healthy persons and in 20 cases of atony. The method consists in the injection of water into the colon after the bowel has been unloaded, and the determination of the quantity of water necessary before a splashing sound may be obtained on palpation on shaking the patient. In the 40 healthy persons the quantity of water needed for the development of the splashing sound varied from 500 to 800 cc., whereas in the cases of atony the quantity never exceeded 450 cc. In the former the succussion splash was very weak or absent, while in the latter it was always present and was usually very marked. Finally, the position of the transverse colon can be determined in this way. In the healthy subjects the lower border was always at or above the umbilicus; in the atonic cases it was always below that line, and often considerably so.

Intestinal Obstruction.—Schule² records a case regarded as stenosis of the duodenum by gall-stone which ended in recovery, and remarks that the most characteristic sign of obstruction of the lower part of the duodenum is the continuous overflow of bile into the stomach, and, on the other hand, the failure of stercoraceous vomiting and the absence of meteorism.

Tumors.—Heidenhain³ regards hiccough as a result of irritation of the phrenic nerve at its center, peripherally or by reflex impulses. He reports in detail a case of very obstinate character in which the cause was a carcinoma of the colon.

Faulhaber⁴ records an instance of myoma of the muscular coat of the ileum which had occasioned repeated attacks of partial intestinal obstruction, and finally a local peritonitis. The tumor was the size of a small fist, and was partly degenerated. The literature contains no similarly large myoma of this region.

¹ Med. News, Aug. 11, 1894.

² Berlin. klin. Woch., No. 45, 1894.

³ Ibid., No. 24, 1894.

⁴ Wien. klin. Woch., 1894, No. 17.

Intestinal Intoxications.—J. A. Roorda Smit¹ states that meat-poisoning is a very common occurrence in Argentina, and results almost exclusively from the ingestion of beef more or less decomposed; almost never from use of the meat of other animals. As has been observed in Holland, the use of bouillon and sauces plays a prominent part, showing the solubility of the toxins. Clinically, vomiting, diarrhea, and muscular cramps are prominent, and the first two frequently relieve the system of poison. Occasionally marked depression of the nervous system and oppression in the chest are present, but death is very rare. The cases occur most commonly in the cold part of the year, when the animals are kept out of doors and poorly nourished. They frequently emaciate markedly, and sometimes die of tonic convulsions due to autointoxication. The muscle-fibers of the meat showed signs of brown atrophy.

In an investigation of intestinal putrefaction Mester² finds that this depends very largely upon the state of the gastric secretions. In the absence of free hydrochloric acid the microorganisms entering the stomach pass into the intestines. In such cases he was able to show that the feeding of meat as free as possible of microorganisms was followed by reduction of the intestinal fermentation.

Suckling³ calls attention to the occurrence of an erythematous eruption following enemata of warm water, and ascribes it to absorption of toxic substances dissolved from the feces by the warm water. The rash usually appears in two hours and lasts about twenty-four hours.

DISEASES OF THE PERITONEUM.

Frees⁴ reports 18 cases of tubercular peritonitis with ascites in which laparotomy was performed, and in all of which the diagnosis was established by the microscope. From 1 to 14 liters of liquid were removed, and this for the most part was clear serum, not hemorrhagic; 2 cases being excluded in which the primary seat of infection was eradicated, the remaining 16 gave 25 per cent. of cures. He refers to 2 cases in which the macroscopic appearance was that of tubercular peritonitis, but in which the examination showed the disease to be carcinoma and fibroma respectively.

Goldenberg⁵ details 2 cases of chronic fibrous peritonitis which during life were regarded as malignant disease of the abdomen. The symptoms were marked cachexia, ascites, uncontrollable diarrhea, and apparent tumor deep in the abdomen. The distinguishing features of this form of peritonitis from abdominal tumors are the less circumscribed outline, the lesser resistance offered, the more regular surface, and the fact that the ascitic fluid is not bloody, but serous or seropurulent.

Laache⁶ describes 2 cases of subphrenic abscess—1 secondary to peri-

¹ Centralbl. f. Innere Med., No. 13, 1895.

² Zeitsch. f. klin. Med., xxiv. II. 5 u. 6.

³ Brit. Med. Jour.; Pacif. Med. Jour., Sept., 1894.

⁴ Deutsch. med. Woch., Nos. 45, 46, 1894.

⁵ Ibid., 1895, No. 2.

⁶ Brit. Med. Jour., Jan. 12, 1895.

typhlitis, in which the abscess had ascended to the diaphragm, forming a collection below it, but not connecting with the pleura; and 1 in which there was a ruptured gastric ulcer, causing perforation of the diaphragm and an accumulation of foul-smelling pus in the pleural cavity. Both cases recovered. Thue¹ describes a similar instance of rupture of a gastric ulcer and perforation of the diaphragm. A feature of interest in this case was the fact that the perforation of the diaphragm was of such direction and shape that air was forced through the opening with each respiratory movement.

In a recent study of chylous ascites Bargebuhr² has collected 48 cases from the literature, of which he regards 22 as uncertain and 2 very uncertain in nature. To these Weiss³ now adds another. Two factors enter into the causation—compression and disease of the thoracic duct and some form of disease of the primary lacteals. The former is perhaps the more common cause. In all cases chylous ascites must be distinguished from chyloform ascites, in which condition ordinary ascitic liquid has a milky appearance on account of the admixture of fatty endothelial or tumor-cells. Weiss's case occurred in a man of thirty-six years who had suffered with disturbance of the stomach, colic-like pain in the abdomen, and vomiting for six months, and with swelling of the abdomen for two months before his entrance into the hospital. On examination it was decided that he was suffering with cirrhosis of the liver, and after some medical treatment the abdomen was tapped, a chylous liquid being withdrawn. There was temporary improvement, but later the symptoms recurred and the man grew much weaker. Great anemia, edema of the legs, and hydrothorax developed, and the man died shortly after a second tapping. At the autopsy an infiltrating carcinoma of the stomach, with secondary involvement of the lymphatic glands and vessels of the abdomen and thoracic cavity, was determined. The thoracic duct was compressed by enlarged and carcinomatous retroperitoneal glands, and the chylous ascites was further dependent on the disease of the smaller lacteal vessels.

DISEASES OF THE LIVER.

Jaundice.—Pick⁴ regards jaundice, with the exception of the cases dependent upon obstruction of the ducts by gall-stones, as a result of secretory disturbances in the liver. Under the influence of the nervous system or of toxic agents the bile is reabsorbed by the lymphatics of the liver, instead of being discharged. In conformity with this view he ranks catarrhal jaundice with icterus gravis and Weil's disease as due to toxic agents arising in the intestines; the jaundice of biliary colic as of reflex nervous origin; and the jaundice of the new-born as an instance of autointoxication.

Porter⁵ contends that there are cases of obstructive jaundice in which the occlusion occurs within the biliary lobules and is due to swelling of the

¹ Loc. cit.

² Deutsch. Arch. f. klin. Med., Bd. li.

³ Centralbl. f. Innere Med., July 21, 1894.

⁴ Wiener klin. Woch., 1894, No. 26.

⁵ Am. Med.-Surg. Bulletin, Dec. 1, 1894.

epithelial cells. The swelling and degeneration of the hepatic cells are the result of the action of toxic substances introduced through the circulation. Cases of this character may be either acute or chronic, the latter occurring especially from intestinal derangements in which fermentative poisons are produced. The treatment of this form of jaundice consists in the regulation of the diet, the improvement of the circulation and the blood, and remedies addressed to the liver to stimulate more active secretion, but, first of all, to reduce the cellular swelling so as to free the terminal biliary capillaries.

Potain¹ in considering the question of emotional jaundice distinguishes two kinds—that coming on in a short time and passing off very quickly, and that in which the onset is slow and the course more protracted. The former he thinks due to an immediate reflex dilatation of the vessels of the abdomen and contraction of the biliary vessels, as a result of which the bile finds its way in the direction of the lesser resistance into the blood. The other form is due, in the first place, to nervous atony of the intestinal walls and glands, as a result of which catarrhal inflammation is prone to occur and to extend into the biliary vessels. Coulon² reports 3 interesting cases of jaundice from emotional excitement in children of nervous temperament. In addition to a light icteric hue there were loss of appetite and light-colored stools.

Grawitz³ refers to the occurrence of jaundice as a consequence of the administration of *filix mas*, particularly in combination with an oil, as castor oil. This was attributed by Paltauf to consequent catarrh of the duodenum, but Grawitz has found in the cases indicated that there is great destruction of red corpuscles, and therefore looks upon this as the cause. That the destruction takes place mainly in the liver seemed indicated by the fact that in 3 of his cases there was cirrhosis of that organ.

Rankin⁴ observed two epidemics of mild jaundice. The first occurred in the low-lying part of his district, the second in the high-lying parts. The first comprised 11 cases, and the second 23. Only young people were affected, the oldest being thirteen years; in addition to jaundice there were headache, nausea, vomiting, malaise, but in no case was there any fever. As a rule, the dejections were clay-colored. Recovery was rapid and complete.

Gall-stone.—Galliard⁵ points out that the heart may be involved in biliary lithiasis in several ways: (1) during attacks of colic the cardiac nerves may be excited in a reflex manner; (2) there may be reflex contractions of the pulmonary arteries with increase of blood-pressure and distention of the right heart. In such cases dyspnea with oppression sometimes threatening asphyxia, irregularity of the pulse, and other serious symptoms are noted; (3) toxic substances may be absorbed from the bile, slowing the the pulse; and (4) microorganisms may enter the circulation through the bile-ducts, and may localize in the endocardium, pericardium, or substance

¹ Union méd., No. 70, 1894.

² La Méd. infant; Pacif. Med. Jour., Sept., 1894.

³ Berlin. klin. Woch., p. 1171, 1894.

⁴ Brit. Med. Jour., May 26, 1894.

⁵ Méd. moderne, No. 102, 1894.

of the heart. Cases of this character are not uncommon, and it is not necessary that purulent processes be present in the liver to occasion this form of septic infection.

Guépin¹ reports a case of a woman seventy-six years old who had suffered for some time with constipation, which was attributed to a tumor palpable at the hepatic flexure of the colon. The mass was deep-seated, hard, and movable; its size was variable. After a sharp pain there was developed an abscess in this situation which broke spontaneously, discharging pus with intense odor, and several days later a gall-stone measuring $7\frac{1}{2}$ cm. in the longer diameter by 3 cm. in the lesser. The wound healed kindly.

Hintze² records a case of obstruction of a gall-stone in the common duct, in which the liver became greatly enlarged by interstitial emphysema. The liver after death gave a tympanitic percussion note when it was laid upon a hard substance and percussed, and on section the distended gall-ducts discharged a tough greenish fluid containing abundant bubbles of gas, which were not combustible. A culture of bacterium coli commune was obtained from this liquid, and the author is doubtless correct in his assumption that the gas-formation was due to this organism.

Benedict³ calls attention to the number of autopsies revealing the presence of gall-stones which had been unsuspected during life.

Gubb⁴ briefly notes a case of biliary colic in which, after a primary and long-continued series of attacks, there was relief for several years; then a recurrence which resisted treatment. Olive oil in doses of 8 fluidounces, following on the morning after 5 grains of calomel had been administered, caused immediate cessation of pain, reappearance of biliary pigmentation of the stools, and a disappearance of the bile from the urine. Almost two years later no recurrence had yet been noted. No stone was ever detected, though diligent search was made for a time. The author reports the case to illustrate that, though fallacious deductions have been formed from the discovery of bodies superficially resembling calculi after the administration of olive oil, there is clinical evidence in this case of the efficacy of the treatment.

Robinson⁵ relates that on several occasions during the past few years he has observed cases presenting sudden intense pain in the epigastrium attended by nausea and occasional vomiting. The vomited matter consists of the contents of the stomach or pure bile. The pain remains localized and is continuous. There is marked tenderness and increased resistance in the region of the gall-bladder, but distinct distention of this cavity cannot be made out. There is no fever, the liver is enlarged somewhat, there is moderate constipation, the dejecta are dark and insufficient. The urine is high colored, but contains no bile. Subicteric hue of the sclerotics is the only evidence of jaundice. Neuralgic pains in other parts of the body may occur. These attacks have been variously designated as gall-stone, acute dyspepsia,

¹ Bulletin de la Soc. anat. de Paris, Oct., 1894.

² Münch. med. Woch., No. 10, 1895.

³ Med. News, June 8, 1895.

⁴ Brit. Med. Jour., April 20, 1895.

⁵ Med. Rec., Oct. 20, 1894.

catarrhal jaundice, and gastralgia, but the author thinks them probably due to a spasmodic contraction of the gall-bladder sufficient to shut off in part the lumen of the cystic duct, and would call them acute biliary distention of the gall-bladder.

Hepatic Cirrhosis.—Graham Steel¹ reports an interesting case of cirrhosis of the liver in which there was fever, due to malignant endocarditis, and points out that any long-continued fever in hepatic cirrhosis should always lead to the suspicion of a complication. In his own experience this has most frequently been tuberculosis of the peritoneum, in elderly as well as young persons. This frequency of tuberculosis he ascribes to the tissue-degeneration due to the abuse of alcohol, the original cause of the cirrhosis.

Hanot² points out that among the early symptoms of hepatic cirrhosis is a form of acholia in which the dejecta lose their pigmentation, not from the absence of bile, but from its resorption and elimination with the urine. This acholia is exceptional; as a rule, there is urobilinuria due to the fact that the hemoglobin is transformed into urobilin and not into bilirubin. The conjunctiva becomes icteric and biliary pigment is absent from the urine, but the spectroscope shows the presence of urobilin. Not uncommonly glycosuria occurs, the liver failing to transform into glycogen all of the saccharine or starchy food. Among these early signs of cirrhosis he further calls attention to a form of white edema which is intermittent, renders the skin glossy and tense, and precedes ascites. It is present upon the extremities and over the liver.

Miscellaneous Affections.—Moser³ records an interesting instance of actinomycosis principally affecting the liver. No clinical data are given, but at the autopsy no affection of the jaw was discoverable, and the primary seat of infection was not disclosed. There was bronchopneumonia of the right lower lobe, some fibrinous pleuritis adjacent to this, subdiaphragmatic abscess, and parenchymatous nephritis. A few abscesses were seen in the spleen, but the liver was studded with innumerable miliary foci, with here and there a large abscess containing puriform or cheesy material and having some resemblance to tubercular nodules. The liver-substance was in a state of cirrhosis, the parenchyma being almost completely destroyed.

Hedderich⁴ records a case of phosphorus-poisoning in which the liver underwent a certain amount of atrophy after a primary enlargement, and he has collected from the literature 33 cases in which the condition of the liver was noted, showing that atrophy of the liver is by no means uncommon. Sometimes it is present from the start, when the prognosis is particularly bad; more usually it occurs after a primary enlargement which lasts for the first two weeks.

Revighi⁵ describes a new physical sign for hydatid cysts. This consists in the development of a peculiar sound on combined auscultation and percus-

¹ Canadian Pract., Aug., 1894.

² Revue gén. de Clin. et Thérap., No. 25, 1894.

³ N. Y. Med. Jour., Aug. 11, 1894.

⁴ Münch. med. Woch., Nos. 5 and 6, 1895.

⁵ Policlinico, 1894, No. 11.

sion. He speaks of this as the hydatid resonance, and has found it absent in ovarian cysts with light fluid, in abscess of the liver and in similar conditions.

DISEASES OF THE PANCREAS.

Miscellaneous.—Dieckhoff¹ contributes a most interesting study of pancreatic disease, based on cases of his own and on the reported cases in the literature. There were 2 cases in his series of hemorrhage into the pancreas, 1 in a man of sixty-three years, the other in a middle-aged woman. In neither was there any distinct cause. In the woman there was a history of diabetes extending over a period of years. For four weeks before her death she suffered with severe pains in the abdomen. In the case of the man there were no definite symptoms. The patient had for some time suffered great loss of power, and was at last compelled to take to his bed. He entered the hospital with retention of urine due to a chronic enlargement of the prostate, and died after three days. In this case, as in that of the woman, there were considerable blood in the peritoneal cavity, hemorrhage into the pancreas with destruction of pancreatic tissue, and some areas of fat-necrosis. Three cases of hemochromatosis of the pancreas are included, but they have only a pathologic, not a clinical, interest. There are in the series 4 cases of suppurative pancreatitis. In 2 of these the clinical history is wanting entirely, while in 1 there was a history of biliary colic at intervals during several years, with collapse and rapid death at the end. There were gall-stones in the common duct and hepatic duct, and also occlusion by stone of the pancreatic duct, with suppuration of the gland-tissue. In another of the cases also there were gall-stones. It would seem that the infection in suppurative pancreatitis ascends through the pancreatic duct.

He reports 6 instances of chronic indurative pancreatitis, in 3 of which there were clinical features of diabetes mellitus; in 1 there was a carcinoma of the head of the pancreas; in 2 the disease began as a consequence of arteriosclerosis; in 4 the inflammation was the consequence of irritation ascending the duct. Three cases of primary carcinoma of the head of the pancreas are described, but the clinical features are given in but 1. In this there was increasing weakness and evidences of obstruction of the flow of the bile. The urine contained no sugar. Among the degenerative diseases are described 3 of simple atrophy and 3 of fatty disease with fat-necrosis. There was 1 case of cyst.

Of the entire number of cases—19—there was diabetes in 7. The author has collected from the literature and tabulated 53 cases of total or almost total destruction of the pancreas associated with diabetes. Of 35 of these, 22 were males and 13 females; almost one-half of the cases occurred between twenty-five and forty years of age. The duration of the diabetes varied from a month to eleven years, the average being twenty months. The lesions were—acute pancreatitis, 5; chronic pancreatitis, 15 (with 4 doubtful ones in this

¹ Festschrift gewidmet Theo. Thierfelder, Leipzig, 1895.

group); carcinoma, 4; atrophy and degeneration, 21; cysts, 4. Finally he tabulates 9 cases of serious disease of the pancreas without diabetes.

Hemorrhage and Acute Pancreatitis.—[Clinical records of cases of acute pancreatitis have multiplied considerably in recent years, and, though an accurate diagnosis is rarely possible, suspicion of this disease may not infrequently be entertained.] At a meeting of the Clinical Society of London, Paul¹ reported the case of a man of forty-three years who was seized with colicky pains lasting a few minutes, returning the following day with vomiting. There was constipation and the abdomen was distended; the pulse-rate was 82; temperature was slightly elevated. An enema acted well, but an hour and a half later the man was found collapsed, and died eight hours after his admission, the temperature rising to 102° just before death. Two drams of urine passed before death contained much albumin and casts, but no sugar. Postmortem the peritoneum was found glued by recent lymph to the posterior wall of the stomach. Multiple hemorrhages were found in the pancreas, most numerous near the tail. There was some fat-necrosis. Microscopically much disintegration, with total necrosis in parts of the parenchyma of the pancreas, and numerous hemorrhages were discovered.

Musser² reports a case of subdiaphragmatic abscess due to abscess of the pancreas, with remarks on effusions in the lesser peritoneal cavity.

Nimier³ contributes an interesting study of hemorrhages of the pancreas in which he excludes cases of secondary hemorrhages due to blood-dyscrasia, severe congestion of a general character, and the like. The true primary hemorrhages may be divided into the traumatic and the spontaneous. In the former case the blood is likely to collect in the retroomental space—in the lesser peritoneal sac—and may be mixed with a certain amount of pancreatic fluid which escapes from the injured pancreas. Often a traumatic injury of the organ occasions degenerations which predispose to subsequent spontaneous hemorrhage.

Pancreatic Calculus.—Lichtheim⁴ reports an interesting case in a man of thirty-six years who at the age of twenty-two years had an attack of sharp abdominal colic with bilious vomiting, black stools, and fever. Several similar attacks occurred in subsequent years, and at twenty-eight a very severe one, followed by diarrhea, wasting, excessive thirst and appetite for food. Impairment of the resonance at the apices of the lungs was made out. Four pints of urine of specific gravity 1043, and containing much sugar, were passed per day. There was never icterus. Fat-crystals, but no free fat, were found in the stools. Tuberculosis of the lungs, with calculus of the pancreatic duct and atrophy of the pancreas, was discovered postmortem.

Minnich⁵ ventures the diagnosis of pancreatic colic in the case of a man aged sixty-eight years, who at forty and fifty had biliary colic, during which gall-stones were found in the stools. After seventeen years of freedom he

¹ *Lancet*, p. 914, 1895.

² *Rev. de Méd.*, No. 5, 1894.

³ *Univ. Med. Mag.*, May, 1895.

⁴ *Berlin klin. Woch.*, No. 8, 1894.

⁵ *Ibid.*

was suddenly awakened one night by a similar attack, followed by another the next day, and one a few months later. Then there appeared oppression in the epigastrium, loss of appetite, and after a month diarrhea lasting three days and ending in a slight left-sided colicky attack. The flesh was preserved; there was no edema, no jaundice, but great itching and eczema. Deep pain and tenderness were found at the border of ribs on the left side during the attack. Almost daily attacks followed. The urine contained no sugar. Several times light-gray calculi were found. These fused in a flame, and the residue gave reactions of carbonate and phosphate of calcium.

Holzmann¹ calls attention to three of the symptoms occurring in a case of pancreatic colic previously reported by Minnich. These were the copious salivation attending the attacks, the temporary glycosuria, and the elevations of temperature, resembling those met with in cases of hepatic colic. The first of these symptoms has been regarded as due to the vomiting of pancreatic secretion, but the examinations in the present case served to exclude this explanation, as well as the view that it is due to associated gastric disease. The glycosuria was independent of the attacks. The three symptoms occurring together were sufficient to make the diagnosis, though none in itself sufficed.

Cyst and New Growths.—Richardson² has reported a case of pancreatic cyst successfully treated by drainage. An Italian laborer aged twenty-six years first noticed a painless swelling in the pit of his stomach six months before operation. As it grew larger pain developed. There was no dyspepsia or constipation. The appetite was good; pulse, temperature, and urine normal. Some emaciation developed and the face was cachectic. The fluid removed at operation was viscid, dirty gray, alkaline, and 1008 in specific gravity. It did not emulsify fat and had no digestive or diastatic power.

Schueler³ reports a case of sarcoma of the pancreas from the clinic of Prof. Mossler affecting a man aged thirty-eight years. The disease began suddenly with violent vomiting in July. Later there were also pain and vomiting an hour or two after meals. When admitted to the hospital he was emaciated and extremely weak. Abdominal examination did not disclose a tumor, but palpation was not satisfactory. The gastric juice contained no free hydrochloric acid. There was no sugar nor albumin in the urine, and the case was regarded as one of chronic gastritis. Later some resistance and moderate fluctuation (indistinct tumor) was felt below the left lobe of the liver. By puncture into this there was obtained a brownish fluid which showed merely blood under the microscope. The tumor grew; diarrhea developed without the presence of blood or oil-drops. The patient became weaker and weaker and died. The autopsy revealed a very large hemorrhagic sarcoma of the pancreas, with metastasis to the right and left pleura, involvement of the third and fifth dorsal vertebræ and third, fourth, and fifth ribs.

¹ Münch. med. Woch., p. 20, 1894. ² Boston Med. and Surg. Jour., March 21, 1895.

³ "Sarcoma Pancreaticum Hemorrhagicum," Inaug. Diss., Greifswald, 1894.

Rankin¹ records 2 cases of carcinoma of the pancreas in which there were certain symptoms of a more or less characteristic sort. Among these were emaciation, excessive weakness, paroxysmal pain, and in the later stages deep epigastric tenderness. In 1 there was a lump in the epigastrium. There was an absence of fatty dejections, glycosuria, digestive disturbances, and jaundice. The symptoms which were present were those which are now more and more recognized as characteristic of pancreatic disease, while those which were absent, though highly significant when they occur, are frequently wanting.

DISEASES OF THE KIDNEYS AND DISORDERS OF URINARY SECRETION.

MOVABLE KIDNEY.

Legry² denies the view of Glenard that all cases of movable kidney are part of a general tendency to enteroptosis, but would distinguish such cases from others of simple movable kidney. He considers at length the causes and the symptomatology of this condition, adding little to previous knowledge.

NEPHRITIS.

Etiology.—Sacaze³ calls attention to the fact that slight infections may be followed by severe nephritis, and records the case of a gardener sixty-five years old who in handling wood scratched his hand slightly. The neglected wound swelled, became red, and a severe chill developed. Considerable albuminuria was present at his admission to the hospital. The patient became anemic, and died a month later, when the autopsy showed nephritis with no other important lesions. The staphylococcus pyogenes albus was isolated during life, and the author's conclusion that the nephritis was due to this infection seems justifiable.

There can be little doubt of the relation of gout to nephritis. An interesting addition to existing knowledge is that of Levison,⁴ who found in 42 autopsies in which alterations of the kidneys existed that there were typical uratic deposits in the metatarsophalangeal joint of the great toe, in 12 cases of atrophic granular kidneys, while in the 30 representing other forms of kidney-disease not one was thus affected. A large part of the patients with the typical joint-affection had never suffered regular gout, and he regards the contraction of the kidney as the primary gouty disease.

Aufrecht⁵ again insists that nephritis varies in its nature and pathology, and that it is not to be looked upon as a uniform process. He would reckon acute and chronic parenchymatous nephritis and white contracted kidney

¹ Brit. Med. Jour., May 11, 1895.

² Union méd., Nos. 9 and 10, 1895.

³ Rev. de Méd., Feb., 1895.

⁴ Zeit. f. klin. Med., Bd. xxvii. H. 3 and 4.

⁵ Deutsch. Archiv f. klin. Med., Bd. liii. H. 5 and 6.

among the tubular nephritides, in which in cases of long standing the vasa afferentia become involved. As a result of the latter, alterations of the glomeruli ensue. The so-called chronic nephritis, eventuating in red granular kidney, begins as a vascular trouble, but in cases in which tubular nephritis is associated the form known as chronic hemorrhagic nephritis is brought about.

Semmola¹ regards albuminuria in many cases as due to blood-dyscrasia, and in proof of this view cites experiments which he has recently made. By injecting egg-albumin under the skin of animals he was able to produce an excretion of albumin in the bile, which normally does not contain albumin, and also in the urine. After protracted experimentation anatomical changes of the kidney ensue. He therefore regarded it as an error to look upon albuminuria as a sign of established nephritis. His own view is that it is often the cause of the renal changes. A continuation of the injections led to characteristic retinitis, pigmentation and haziness of the retina, hyaline degeneration, and other ocular changes.

Symptoms.—[Considerable has been written in recent years regarding the occurrence of nephritis without albuminuria, and there is no doubt but that advanced lesions of the kidneys may exist without either albumin or casts in the urine.] Kossler² details a number of cases in which tube-casts, hyaline as well as epithelial, were found without the presence of serum-albumin. Among these there were 18 cases of phthisis, 2 of endocarditis, several of infectious diseases and phosphorus-poisoning. Though serum-albumin was absent in these cases, the great majority presented the characteristic reactions of nucleoalbumin, and in some this was seen to bear a distinct relation in quantity and occurrence to the presence or absence of casts, particularly the epithelial casts. He believes it is necessary to distinguish two forms of cases—one of cylindruria combined with serum-albumin and of cylindruria with nucleoalbumin. He was able to make histologic studies of the kidneys in 12 of the cases of phthisis and in several others, and found the constant presence of lesions of the kidney-cells, but complete absence of exudative or other inflammatory changes.

Marion³ relates 3 cases of unquestionable nephritis occurring in patients respectively nineteen, fifty-eight, and fifty-nine years, in whom albuminuria was not present. In the first there was never albumin in the urine; in the second, a chlorotic girl, there was no albumin when the first symptoms occurred, but two years later she was readmitted with albuminuria. In the third case the patient had been under treatment for nephritis with albuminuria. Later she was admitted with influenza, and the albuminuria entirely disappeared, but the symptoms of Bright's disease persisted.

Senator⁴ discusses the question of dropsy in kidney-disease, and would distinguish certain forms due to weakness of the circulation and to cachexia. From the latter he distinguishes a variety which might be classed as real

¹ *Riforma Med.*, 1894, No. 254.

² *Berlin. klin. Woch.*, April 8, 1895.

³ *Arch. gén. de Méd.*, March, 1895.

⁴ *Berlin. klin. Woch.*, No. 8, 1895.

renal dropsy, and which occurs only very early in the case, involving the eyelids, the tibial region, and the scrotum, and which spreads very rapidly. The skin presents a light color or pallor. The explanation of Bright was that renal dropsy is due to hydremia, and, later, Stewart and Bartels ascribed it to hydremia and increase of the watery elements of the blood; but both of these theories are probably fallacious. Senator inclined to the view of Cohnheim, that there is abnormal permeability of the blood-vessel walls, and in proof of this points out that this form of dropsy is more common in the nephritis of scarlatina, of exposure, of malaria, and of other conditions in which the glomeruli are mainly involved; whereas in toxic nephritis and that of infectious diseases dropsy is less common, and the alterations mainly affect the parenchyma of the organ. The same vascular permeability probably occurs in the subcutaneous blood-vessels and lymphatics as well. Renal dropsy, therefore, is an indication of glomerulonephritis, but the latter does not necessarily involve the occurrence of dropsy.

Fiessinger¹ reports 2 interesting cases of uremia of sudden onset occurring in brothers. In the first, aged forty-two, an alcoholic, sudden unconsciousness with convulsions came on after abdominal distress the night before. Three convulsions occurred in one morning. On the third day he was back at work. During the attack there was almost complete anuria, and the urine contained albumin and a trace of sugar. Two days after the attack it was perfectly normal. Six years after this occurrence the patient remains healthy. The second brother, after headache and anorexia for forty-eight hours, was suddenly seized with orthopnea, cyanosis, and cough with bloody expectoration. This occurred at night and lasted a few hours. The next day the patient was up, and the third day was at work. The urine during the attack was slight in amount, highly albuminous; the following day it was abundant, contained uric acid, a few casts, but only a trace of albumin. In neither of the cases was there arterial disease. Fiessinger explains these cases as being temporary congestion of the kidneys due to vasomotor influence, the congestion causing edema of the connective tissue and compression of the blood-vessels, shutting off the blood-supply of the glomeruli.

Rothmann,² in reporting 2 cases of transitory blindness occurring in the course of uremia, discusses the various views regarding the condition, and concludes that the blindness occurring in severe nephritis, with or without other uremic symptoms, is peripheral in nature and due to edema of the optic sheath. The pupillary reaction may be present or may be lessened or absent. If present, prognosis is relatively good. When the pressure of the exudate is great, degeneration of the optic nerve may ensue and permanent blindness may result. In transitory blindness the optic nerve recovers completely.

Kelly and Fussell³ call attention to the frequency with which cases of nephritis present themselves at their out-door clinic, in whom there are no

¹ *Gaz. méd. de Paris*, March 2, 1895.

² *Berlin. klin. Woch.*, No. 30, 1894.

³ *Univ. Med. Mag.*, June, 1895.

ordinary symptoms of this disease, and detail 8 such cases in which only the routine physical examination and urine examination practised at the clinic served to discover the underlying disease. In 1 case, for example, pericardial effusion with great displacement of the heart and highly albuminous urine were found in a man whose only symptom was swelling of the cervical lymphatic glands. Other cases of a similar nature, perhaps less striking, are recorded.

Bremer¹ calls attention to the occurrence of nervous symptoms probably due to uremia in latent cases of nephritis in which albuminuria, edema, and cardiac symptoms are entirely wanting. Among the cases observed by him difficulty of appreciating place and time, tingling in the extremities, weakness, aphasia, neuralgias, neurasthenia, and spasmodic conditions of the muscles were noted. In all cases casts were found, and sometimes leukocytes and urates. The pulse was sometimes slowed, catarrhal conditions of the respiratory and digestive tract supervened, and intermittent albuminuria was occasionally seen. In 4 cases temporary glycosuria was noted.

Treatment.—Skłodowsky² recommends calomel as a most efficient diuretic in the dropsy accompanying nephritis. The number of observations was not sufficient to establish the cases in which it will do the most good, but the remedy is incapable of exercising deleterious effects upon the lesion in the kidney, and indeed seems to have a favorable action if any.

Pepper³ also records a case illustrating the remarkable value of calomel as a diuretic in some cases. The one reported was an instance of cardiac and renal disease with great dropsy. The points of interest were the facts that small doses failed entirely of the effect; that the best result was attained when the dose was from 1 to 3 grains, guarded with opium; and that the effect soon wore off. A renewal of the treatment after a short interval was in every case attended by the same happy effect as before.

DaCosta⁴ finds the lactate of strontium in doses of 30 grains four times daily an excellent diuretic in cases of nephritis.

Lueck⁵ recommends very highly the use of pilocarpin in acute nephritis in childhood, and Mollière⁶ advocates the external use of the same remedy, applying it in the form of an ointment. He has used this treatment in all forms of nephritis for ten years, comprising 50 separate cases, with excellent effect.

ALBUMINURIA.

Ott⁷ has made some investigations regarding the value of the more delicate tests for albumin in the urine, and also regarding the possibility of the occurrence of dietetic albuminuria. So far as the latter question is concerned, he concludes that the condition frequently occurs, and especially after the ingestion of insufficiently cooked albuminous food. The different results

¹ Med. News, Oct. 20, 1894.

² Jour. de méd. de Paris, July 8, 1894.

³ Med. News, Dec. 15, 1895.

⁴ Ibid., April 21, 1895.

⁵ Ther. Gaz., Nov. 15, 1894.

⁶ Revue Internat. de Thérap. et Pharmacol., No. 21, 1895.

⁷ Deutsch. Archiv f. klin. Med., Aug. 25, 1894.

of various investigators are explained by the facts that the resulting albuminuria is temporary and usually very slight, and that it does not occur in all persons or at all times. There seems to be no tendency to the development of organic disease. The cases of "intermittent albuminuria," described variously as "cyclic," "transitory," etc., he regards as due to latent and slight organic disease of the kidneys. Usually in these cases diet has but little influence, but exercise does have some effect very regularly. Casts are found from time to time.

Somewhat similar opinions are entertained by Oswald¹ from a study of 9 cases of cyclic albuminuria, 7 at least of which were absolutely typical and observed for a long time. He does not regard these cases as purely functional albuminurias, but holds that lesions of the kidneys are present in all. The patients in question suffered for a long time with weakness and relaxation, headaches, heaviness of the limbs, palpitations, vertigo, gastrointestinal troubles, and nose-bleed. They were anemic, and for the most part in the second decade of life. No case was fatal, and there are no fatal cases reported in literature. In all of his cases (with one exception) there were hyaline and sometimes epithelial casts, with fatty epithelial cells in the urine, and at times so abundantly that the question of functional albuminuria could not be entertained. The author calls attention to the fact that the urine secreted during the day should be examined in such cases, and emphasizes the necessity of recognizing the nuclealbumin by the acetic-acid-ferrocyanide of potash.

F. C. Shattuck² finds in the examination of the urine of persons seeking his advice for various ailments that renal albuminuria, as shown by the presence of both albumin and casts, is not uncommon quite apart from Bright's disease. This is especially the case among older persons, and he believes that faint traces of albumin and hyaline or finely granular casts are of little practical importance in persons beyond fifty years of age.

Stephan³ thinks that in many cases functional albuminuria is due to toxic causes, which may be introduced into the body or may be produced by digestive or metabolic disturbances within the body. Other cases may be reflex-vasomotor, or trophic in character. The first group of cases he believes quite common, and cites the frequency of intermittent or cyclic albuminuria in cases of dilatation of the stomach in which congestion of the liver is associated (Bouchard). He distinguishes also a group of cases of purely functional albuminuria which he regards as evidence of disturbance of metabolism. Such are the cases occurring in bicyclers, sportsmen, and others after cold bathing, also those instances following mental overwork, and the instances of transitory albuminuria in weakly persons without definite cause. In all of these cases albuminuria occurs without any casts. [Other observers, however, assert that casts may be found in many such cases, if not in all, and our own experience is favorable to such a view. The more carefully

¹ Zeit. f. klin. Med., Bd. xxvi. Hft. 1 and 2. ² Bost. Med. and Surg. Jour., June 21, 1894.

³ Centralbl. f. Innere Med., No. 18, 1895.

such cases are investigated, and the more frequently the urine is examined, the less frequently are casts found wanting. They are not infrequently reported as absent when few examinations have been made or the urine of only one time of day selected for examination.]

Stokvis¹ and his pupil Doyer² have made studies of the effect of etherization and chloroformization upon the constitution of the urine. In 52 cases chloroform was used, in 44 ether, and in 4 both, and the urine was examined immediately after the operation and up to the fifth day. Albuminuria was found in 33 per cent. of the chloroform, in 43 per cent. of the ether, and in 25 per cent. of the combined ether and chloroform narcotizations, and hyaline and epithelial casts respectively in 12½, 27, and 25 per cent. of the cases. The functional disturbances of the kidneys were on the whole directly proportioned to the quantity and the duration of the narcosis, and were usually absent after short anesthetizations. The authors consider the various theories which might be applied in explanation, and conclude that these anesthetics produce a mild and transient toxic nephritis. After the second to the third day every trace of albumin and of casts had disappeared in their cases. Kouwer,³ on the other hand, in examining the urine of 100 cases in private practice could find in but 5 of these any trace of albumin with the acetic-acid-chloride-of-sodium test, although the duration of the narcosis was generally long. In all of the cases casts were absent. Zeehuisen in discussion of Stokvis' paper remarked that in his experiments upon rabbits, which were made to inhale air containing vapors of chloroform and ether (the animals not being tied), there was a constant presence of albuminuria and casts after narcosis.

Boyd⁴ in studying the question of blood- and serum-albumin in the urine finds that in albuminuria both are present as a rule, though exceptional cases are met with. No conclusion can be reached regarding the nature of a case from the proportions of the serum-albumin and globulin, and even in amyloid degeneration the globulin may not be in excess. In the albuminuria of heart-disease, in which there is no chronic kidney-disease, the globulin is usually more abundant than is commonly the case in chronic interstitial nephritis.

Ott⁵ has made extensive studies to determine the presence of nucleo-albumin in the urine, and applies a new test which seems to be very delicate. Equal parts of saturated solution of common salt and of urine are mixed, and Almen's solution is added, causing a precipitate of nucleoalbumin. He found this substance present in varying quantity in every one of 205 cases studied. The reaction of the urine, whether alkaline or acid, was without influence; in fevers after a time there was an increase of the nucleoalbumin, followed by a decrease. In cases of febrile albuminuria the nucleoalbuminuria precedes serum-albuminuria, and persists after its disappearance.

¹ Centralbl. f. Innere Med., No. 2, 1895.

² Ibid. and Dissertation, Amsterdam, 1894.

³ Centralbl. f. Innere Med., No. 2, 1895.

⁴ Edinburgh Med. Jour., May, 1894.

⁵ Centralbl. f. Innere Med., May 25, 1895.

Albumosuria.—Raschkes¹ denies the assertion that albumosuria is diagnostic of multiple myelosarcoma, and records a case of senile osteomalacia in which there was albumose as well as albumin.

Peptonuria.—Robitschek² has made an elaborate study of the question of peptonuria and its significance. The only normal condition under which it seems to exist is the puerperal state. In general it is an evidence of tissue-metamorphosis and the passage of pepton into the blood. As a diagnostic sign it has limited value, since it occurs in a great variety of conditions. The author's deductions are based upon the study of 121 cases of 49 different diseases.

Hemoglobinuria.—Chvostek³ contributes an exhaustive clinical study of the literature of paroxysmal hemoglobinuria, with experimental investigation of a case of his own. The case was previously studied by Kobler and Obermayer.⁴ In a relapse it came under the author's care. His studies lead to the conclusion that the disease is one of the blood and the circulation. He believes his experiments show that there is a lessened power of resistance to mechanical impressions, but not to cold, on the part of the red blood-corpuscles. The lessened resisting power may be due to many causes, among which syphilis, malaria, and various other infectious diseases are prominent. During the attacks there is hemoglobinemia, but not at other times. The immediate cause of the attacks is some disturbance in the circulation, most frequently due to external cold, which causes great vascular contraction on account of heightened nervous excitability of the vasomotor apparatus. He showed that it is possible to cut short the attacks by the use of remedies that dilate the vessels. The actual destruction of the red corpuscles may take place in the peripheral circulation or in the internal organs, notably the kidneys.

Curtois-Suffit⁵ remarks that though the influence of acquired syphilis has been recognized among the factors causing paroxysmal hemoglobinuria, no instance of the relation of the congenital form has been recorded since the report of Gœtze in 1884. He now contributes a further case that occurred in a two-year-old boy. In winter, and always on the coldest days, he suffered with nervous symptoms and general signs of illness, and with urticaria followed by hemoglobinuria of two days' duration. The urine during the attacks was dark in color, albuminous, and presented the spectroscopic appearances of hemoglobin. During the intervals it was completely normal. The boy had evidences of congenital syphilis inherited from the father. Under treatment with inunctions of mercury and with potassium iodid the attacks soon subsided.

Hemoglobinuria.—Lion⁶ reports a case of infection by *Proteus vulgaris* occurring in a man thirty-five years old, who presented considerable enlarge-

¹ Prag. med. Woch., 1894, No. 51.

² Zeit. f. klin. Med., xxiv, H. 5 and 6.

³ Paroxys. Hemoglobinuria, Deuticke, Leipzig and Wien, 1894.

⁴ Zeit. f. klin. Med. xiii. p. 163.

⁵ Méd. moderne, March 2, 1895.

⁶ Compt. rend. de la Soc. de Biol., December 29, 1894.

ment of the spleen, with fever and hemoglobinuria; death following in eight days, during coma. The blood and urine showed the presence of hemoglobin, and there were no blood-corpuscles in the latter. Toward the end hemoglobinemia and hemoglobinuria both disappeared. The hemoglobinuria was not due to a pathologic condition of the serum, since the isolated blood-corpuscles remained intact forty-eight hours without dissolution in the latter. The heart's blood, spleen, liver, and kidneys, all contained the organism named.

Chyluria.—Moscato¹ records a case of a woman forty years of age who became ill with chyluria, and who presented severe nervous symptoms of an hysteric character, ending in paralysis of the arm and pain in the region of the right kidney. In the midst of a paroxysm of fear she passed in the urine a *Eustrongylus gigas* 9 c.cm. in length. After this the chyluria and the nervous symptoms disappeared, but four months later a second and equal-sized parasite was voided, but the symptoms on this occasion were much less marked.

Cystinuria.—Pfeiffer² records a most interesting group of cases of cystinuria affecting four members of one family. The father of the family and several of his brothers were gouty, but there was no other suggestive family history. The condition was first discovered in the eldest sister of the family after she had suffered renal colic and passed a stone which on examination proved to be composed of cystin. She had long suffered with cystitis and pyelitis, but cystinuria was not suspected or discovered until the examination of the stone led to examination of the urine. Soon after the passage of the calculus the cystin disappeared from the urine. The urine of a younger sister and of two brothers exhibited the same condition, while that of the parents, as well as of two children of the eldest daughter, was free.

Hall³ records a case of cystinuria that occurred in a miner of thirty-two years of age. The disease began ten years before he came under observation. At that time and at intervals subsequently he passed small or large calculi. While under observation the patient was placed upon alkaline treatment, and it was found that the addition of acid to the urine did not suffice to throw down a precipitate, which suggested that there was an actual disintegration of the cystin as a result of the treatment.

Acetonuria.—Conti⁴ finds considerable acetone in febrile urine, and the latter is highly toxic; but the acetone is not a constant or sure index of toxicity. Acetone is a frequent sequel of operations, and traces may be found in the urine of healthy persons, but it cannot be regarded as a necessary product of metabolism.

Hematoporphyrinuria.—Müller⁵ calls attention to the hematoporphyrinuria that occurs after the use of certain coal-tar products: notably sulfo-

¹ Rivista Clin. e. Terap., Oct., 1894.

² Centralbl. f. die Krank. der Harn- und Sexual-Organen, Bd. v. H. 5.

³ Quarterly Med. Jour., Oct., 1894.

⁴ Riforma Med.; Pacif. Med. Jour., Sept., 1894.

⁵ Wiener klin. Woch., 1894, No. 14.

nal and trional. The long-continued use of either, even in small doses, may cause trouble, and the case becomes incurable if the drug is not withdrawn. The earliest symptoms in sulfonal-poisoning are usually such as vertigo, weak memory, ataxic gait, disorders of speech. Then follows the destruction of the red corpuscles of the blood and the excretion of hematoporphyrin (iron-free hematin) in the urine, making the latter cherry-colored or dark blue-red. It is always excessively acid. Prompt withdrawal of the sulfonal and the administration of alkalies are the proper remedial measures.

Lipuria.—Schlossmann¹ records a case of lipuria following the ingestion of castor oil and olive oil in a child of a year and a half. The urine presented a milky appearance and contained phosphates, and a large quantity of fat in the form of minute droplets. The next day there was but little fat.

Hydrothionuria.—Savor² describes a case of hydrothionuria occurring in a woman of twenty-two years during a protracted (five days') attack of eclampsia. Catheterization was necessary, and during ten days the condition spoken of was observed, and at times there was such an amount of sulfuretted hydrogen present that there was pneumaturia as well. Careful bacteriologic examination revealed the presence of the *Bacterium coli commune* in considerable abundance. The author looked on the case as one of decomposition due to the bacterium in question.

Lithuria.—Harley³ points out that uric-acid deposits may be of two sorts—those due to increased tendency to precipitation, and those due to increased formation of uric acid. The majority of cases belong to the first group. In the treatment of such, piperazine and alkalies are useful to cause solution of the uric acid, and diet is relatively unimportant. In cases due to increased formation of uric acid a carbohydrate diet is recommended. He denies the old idea that sugar causes increase of uric acid, but admits that alcohol does. Quinin and arsenic are to be given, because they diminish the number of leukocytes, and thus the amount of uric acid. Moderate exercise is useful; excessive exercise harmful.

Pneumaturia.—Heyse⁴ records a case of gas-formation in the bladder in a case of myelitis with retention of urine. After catheterization had been practised for some time gas was found to escape with the urine, and a tympanitic note was discovered over the bladder. At the autopsy a short time after this there was found, in the bladder, ureters, and substance of the kidneys, a short bacillus corresponding with Escherich's *B. lactis aerogenes*, and the author thinks that this was introduced by the catheter.

Miscellaneous.—Robin⁵ has contributed some interesting studies of the quantity of the urine in phthisis. He would distinguish several periods: (1) that before the active pulmonary lesions have been established, and during which there is increase of the urine without increase of its solid constituents—*polyurie pré-tuberculeuse*; (2) the first stage of active pulmonary disease,

¹ Archiv f. Kinderheilkunde, Bd. xvii. p. 251, 1894.

² Wien. klin. Woch., 1895, Nos. 8 and 9.

⁴ Zeit. f. klin. Med., 1894, xxiv. p. 130.

³ Brit. Med. Jour., March 23, 1895.

⁵ Arch. gén. de Méd., 1894, May and June.

during which there is still polyuria, but also increase of the solid matters excreted, especially the phosphates—*polyurie phosphaturique*; (3) the second stage of active pulmonary disease, during which the quantity is normal, with occasionally transitory polyuria; there may be constant polyuria from associated kidney-disease; and (4) the third stage of pulmonary affection, in which there is habitually decrease in the quantity of urine, partly due to fever and partly to serious nephritis.

V. Jaksch¹ reports 2 interesting cases of the formation of mucous and fibrinous casts in the genitourinary system. The first was that of a woman who gave a clinical history of renal colic, and whose urine contained spiral masses not unlike those seen in the sputum, composed of mucus and epithelium with crystals of sodium sulfate. The lesion was probably a ureteritis due to the passage of a stone. In the second case a man of thirty-nine years had fever and pain in the region of the left kidney; the urine contained albumin, tube-casts, epithelium from the pelvis of the kidney, and hematoidin. Besides these there were masses of coagulate fibrin 10 cm. long and 3 to 4 mm. thick, covered with epithelium of the tubules. These were abundant for six days, then disappeared, the pain and tumor in the region of the kidney at the same time disappearing.

ANIMAL PARASITES.

Intestinal Worms.—Lutz² has observed a case of *Tenia flavo-punctata* in a two-year-old child in Brazil, and also 2 cases of *Tenia nana*. In the first of the latter there was but one worm; in the second, a considerable number. In both forms of tape-worms he regards the rat as the intermediate host, having discovered both in this animal.

Surgeon-captain Crawford³ found in each of a number of cases of cholera coming to autopsy in the jail-epidemic at Saran, India, that the intestine contained lumbricoids, and in 7 of 15 which recovered, round-worms were passed during life.

Boas⁴ observed a case of invasion by *Trichocephalus dispar* in a man of seventy-one years, who presented gastrointestinal symptoms, and later continuous diarrhea. The diagnosis was made by the presence of eggs which were found microscopically. Vermifuges failed to remove the parasites. The patient worked as a laborer in digging a canal, and frequently ate his meals while still at work.

Sandwith⁵ has studied 402 cases of ankylostomiasis at Cairo. Of all of these cases, only 3 belong to the female sex. Among 200 men of whom careful notes were kept, 190 were accustomed to work in more or less damp earth with their hands. The remaining 10 had various occupations, but 2 of them admitted that they were earth-eaters. Regarding the diagnosis, the author states that in any case in which the ova are not found under the

¹ Zeitsch. für klin. Med., vol. xx, 6, 1893.

² Centralbl. f. Bakt. und Parasit., Bd. xvi. H. 2.

⁴ Centralbl. f. Innere Med., No. 14, 1895.

³ Edinburgh Med. Jour., Nov., 1894.

⁵ Lancet, June 2, 1894.

microscope the diagnosis may be made by cultivation in damp earth exposed to the air. The symptoms may be grouped in three classes—those affecting the digestion, the circulatory, and the nervous systems. Usually some gnawing or throbbing in the epigastrium is the first sign. The appetite is variable. Constipation was the rule, and in 68 per cent. of uncomplicated cases there were a few days of fever at the onset. It is noticeable that the author never found any retinal hemorrhages, epistaxis, or any general tendency to hemorrhage in all of his cases. Mental heaviness was quite common. In about 75 per cent. of all, the number of corpuseles in the blood was below 3,000,000, and the average of hemoglobin was 26 per cent. The duration of the illness was variable, nearly every patient stating that he had been ill two or three years before admission to the hospital. The mortality of the disease is comparatively low, 8 per cent. only having died. Regarding the position of the worms, it was exceptional to see them in the duodenum, and as a rule the attached worms were all within two meters of the pylorus, and had their heads and sometimes half their bodies buried in the mucous membrane.

Treatment of Intestinal Parasites.—Regarding the treatment of ankylostomiasis, Sandwith¹ found thymol the most useful remedy. For a day or two before this is administered the patient is kept on a milk and soup diet. At 8 A. M. and 10 A. M. he receives 2 g. of thymol, and at 12 A. M. castor oil or magnesia. A number of doses of the anthelmintic may be required, the average number in his experience being 2.6 doses.

Sonsino,² while speaking of the happy effect of thymol in most cases of ankylostomiasis, admits that it is sometimes unavailing, and asserts that the drug acts on other worms only exceptionally. The administration of enemata containing thymol for trichocephalus, which he at one time recommended, he now recognizes would be dangerous treatment. Regarding the best method of administering thymol, he advises that it be given in powder form enclosed in wafers.

Hard³ confirms the statements of Mirovitch regarding the efficiency of naphthalin in the treatment of tape-worm. A single dose usually suffices. The drug is very disagreeable to take, but it does not cause toxic symptoms like some others of the teniafuges. After three meals containing excess of salty and vegetable acid food, about 20 gr. of the drug are administered in capsule; this is followed in four hours by a free dose of calomel with soda, and this in turn by castor oil.

Schmitz⁴ reports the results of the treatment of 46 cases of oxyuria with naphthalin according to the method of Ungar. This consists in preliminary cleansing of the intestinal tract by some mild purge; then the administration of naphthalin in the form of powders with sugar. From 0.15 to 0.4 g. of the drug are administered four times daily for two days. After a week a second course is given, and after two weeks a third. With this treatment 26

¹ Loc. cit.

² Lancet, Dec. 1, 1894.

³ Cincinnati Med., 1894, p. 711.

⁴ Inaug. Diss., Leipzig, 1894.

of the cases were definitely cured. In the other 20 it could not be asserted that a complete cure had been effected. During the treatment fatty and oily food must be avoided.

Tænia Echinococcus.—Hencynski¹ contributes an interesting statistical paper on hydatid disease rupturing through the urinary passages. He found 10 cases of hydatids of the kidney which ruptured into the pelvis, and were discharged through the ureter, and 2 cases of cysts of the liver discharging in the same way. Perforation directly into the bladder occurred in 7 cases, in which the primary seat was the bladder itself in 2, and the connective tissues about the bladder in 5. Clinically, the renal cases were characterized by attacks of renal colic, but not with the customary severe pains of this condition. In the cases of hepatic cysts and of direct rupture into the bladder the symptoms were mainly those of sudden over-distention of the bladder.

Vespa² reports a case of hydatid of the lung in which improvement followed the inhalation of from 20 to 30 c.cm. of ether daily.

Distomiasis.—Ward³ discovered in the lung of a dog in Ohio the *Distoma Westermanni*, a fluke-worm common in some parts of Asia, but not previously observed in America, excepting once in a cat by the same author. This second discovery is of importance, in that there was no possibility of the parasite having been imported, and establishes its position as one of the indigenous entozoa. It has not as yet been found in man in this country.

Filariasis.—Flint⁴ reports a case of *Filaria sanguinis hominis* treated successfully with methylen-blue in doses of 2 grains every four hours.

Monadines.—Miura⁵ records the case of a man who complained of pain in the region of the left kidney, and in whose urine small flaky formations somewhat resembling clap-threads were seen. These on microscopic examination showed active monadines, which he identified as *Trichomonas vaginalis*, and he found the same organism present in large numbers in the vaginal secretions of the patient's wife. The source in the man was found to be the urethra.

¹ Festschr. gewidmet Theodor Thierfelder, Leipzig, 1895.

² Il Policlinico, Oct. 1, 1894.

³ Med. News, March 2, 1895.

⁴ N. Y. Med. Jour., June 15, 1895.

⁵ Centralbl. f. Bakt. und Parasit., xvi. No. 2.

GENERAL SURGERY.

By W. W. KEEN, M.D., AND JOHN CHALMERS D'ACOSTA, M.D.,
OF PHILADELPHIA.

SUPPURATION AND ABSCESS.

The Treatment of Phlegmonous Inflammation by Alcoholic Dressings.—It is stated¹ that Dr. Salzwedel of Berlin has devised an excellent means of treating phlegmonous inflammation by permanent alcoholic dressings. After the skin of the affected part has been washed with ether, it is covered with absorbent cotton steeped in alcohol, the strength of which must not be less than 60°. This is covered with a piece of waterproof applied so as to retard, but not entirely prevent, the evaporation of the alcohol. This end is attained by cutting small openings in the waterproof. If a sore exists, it must be protected by means of antiseptic gauze. The favorable effect on phlegmonous inflammations is extremely prompt. On the other hand, if the abscess is far advanced, the alcohol dressing is said to prevent its further extension, hastening the suppuration so that the abscess may be opened in a few hours. [Waiting for even a few hours is questionable. Early operation is certainly indicated. Dr. Halsted of Johns Hopkins is an advocate of the treatment of abscesses in the vascular soft parts or in cancellous bone by complete excision of the abscess-wall and closure of the abscess-cavity. He holds that the tissues and blood-clot destroy organisms after disinfection has been complete, and that in these situations drainage is unnecessary. Warren in his recent book on Surgical Pathology calls attention to the important fact long since asserted by Volkmann, but often lost sight of, that if on opening an abscess with cheesy contents the muscle is found to be cheesy, the disease is syphilitic and not tubercular. In syphilitic abscesses there is no limiting membrane and we cannot scrape away the abscess-wall. A distinct abscess-wall is absolutely diagnostic of cold abscess.]

Abscess of the Diaphragm.—Meltzer² reports the case of a child, 26 months old, with pneumonia of the right apex. This pneumonia was followed by a condition that was diagnosed as empyema of the right side. An exploratory puncture permitted the escape of pus. On the

¹ N. Am. Pract., Nov., 1894.

² Internat. klin. Rundschau, No. 29, 1893.

following day Estlander's operation was performed, but very little pus was discovered in the pleural cavity. On examination, the diaphragm was seen to be pushed up into the pleural cavity and to fluctuate. [It is apparent this condition must have originated from infection of the lymph-vessels of the diaphragm, with subsequent formation of an abscess.]

Abscess of the Maxillary Antrum.—Spicer¹ of London discusses the surgical treatment of abscess of the maxillary antrum. He makes free incision through the canine fossa with a chisel, secures a large opening into the anterior wall of the antrum, and makes a groove down the alveolus. He explores the antrum with his finger, and uses a curet. He now makes two large openings from the nasal cavity into the antrum, a trocar and cannula being inserted into the inferior meatus behind the nasal-duct opening, irrigates the antrum, and packs it with creolin-gauze. [We would note here that iodoform-gauze would seem to be better suited for packing; furthermore, that these cases often occur because of improper initial treatment.] No form of mechanical drain is used, the gauze remains in place forty-eight hours, and subsequently irrigation is practised two or three times a day. In a paper read at the Rome Congress, Gradenigo² offers the following conclusions upon empyema of the maxillary sinus: 1. That collections in the maxillary sinus are often found. In one series of cases they occurred in 17 per cent., in another series in 25 per cent. 2. The absence of any lesion of the parts and the frequent occurrence of the condition on both sides entitle us to place these collections in a group separate from true empyemata. 3. It seems highly probable that these affections are not of dental but of nasal origin. 4. Cysts in the mucous membrane of the sinus that contained either pus or serum occurred in 2 per cent. of all the cases.

The Gouty Diathesis and Furunculosis.—Broco³ states that gouty individuals who have neither diabetes nor albuminuria are apt to develop furunculosis, and for this condition extract of colchicum gives most admirable results. [It would seem, in view of this observation, that in all cases of persistent furunculosis in which neither diabetes nor albuminuria is present, treatment should be directed toward the gouty diathesis.]

Conditions of Suppuration.—Reichel⁴ discusses the predisposition of tissues to suppuration and the methods of disinfecting wounds. All factors tending to promote the absorption of microorganisms and of their products antagonize suppuration; all factors tending to retard absorption favor suppuration. A single bleeding before infection hinders suppuration by promoting absorption; frequent and profuse bleeding does not aid suppuration. If after loss of blood saline fluid is injected, pus-formation is favored. Increase of blood-alkalinity hinders suppuration, diminution of alkalinity

¹ Jour. Laryngol., Oct., 1894.

² Ibid., 1894, viii., p. 397.

³ Jour. de Méd. et de Chir., quoted by Lyon médical, No. 9, 1895.

⁴ Sitzung-Berichte d. phys. med. Gesellsch. zu Würzburg, 1894.

promotes it. Every condition that increases cellular activity tends to prevent suppuration. Experiments upon rabbits prove that very extensive purulent processes may be arrested by free incision, excision of the infected area, and packing with iodoform-gauze. In fresh wounds Reichel advocates strict asepsis, not antiseptis. In infected wounds and suppurations he advocates incision under antiseptic precautions, packing with antiseptic gauze, and the employment of a secondary suture.

The Aseptic Treatment of Suppuration.—Zeidler¹ of St. Petersburg discusses the treatment of suppuration, and advocates asepsis rather than antiseptis. He holds that Schimmelbusch's experiments confirm the belief he has long held, that it is practically impossible to destroy organisms that have gained access to the interior of wounds. Zeidler's method is as follows: Prepare the field of operation as usual, incise, thoroughly dissect out all pus-infiltrated tissues, wipe with sterilized gauze and irrigate with a 6 per cent. saline solution, pack lightly with sterilized gauze, and dress with dry aseptic dressing. This dressing may often be left in place without change for eight days, but if it soaks, change the outer pads without touching the deeper parts of the dressing.

ANTHRAX.

The subject of anthrax in man is considered by Müller,² who asserts that it is impossible to destroy the disease by excision of the seat of inoculation. In guinea-pigs amputation of the limb performed a few hours after the foot had been inoculated failed to save the animal from the disease. He says that the object of treatment should be to cause the cells at the site of inoculation to arrest the dissemination of bacteria and thus to protect the body from poisoning. The products at the site of inoculation are harmful if absorbed, but they are also destructive to the anthrax bacilli in situ, hence excision should not be practised. He recommends the following treatment: Immobilize the affected part and the near-by joint in order to prevent involvement and dissemination; elevate the limb to assist the return of venous blood; apply mercurial ointment; and administer alcohol in large doses. [This view is opposed to established belief. Tillmanns says that anthrax is local in man longer than in animals, and that, consequently, more is to be expected from excision and cautery. He recommends excision, cautery, and injection in the area of infection and around about it of a 1:1000 solution of mercuric chlorid or of a 5 per cent. solution of phenol. Lengyel and Koranyi, by efficient local treatment of this description, lost but 13 out of 142 cases. We should hesitate to reject local treatment, in spite of the observations of Müller.]

¹ *Centralbl. für Chir.*, April 6, 1895.

² *Deutsch med. Woch.*, June 14 and 21, 1894.

AMPUTATIONS.

The Mortality of Operations.—At the meeting of the Surgical Section, N. Y. Acad. of Med., on Feb. 21, 1895, the subject of amputations was introduced by Dr. Erdmann. He considered the statistics of 703 amputations performed at different hospitals in New York City. In this series there were 109 deaths, a mortality of 15.5 per cent. [This, it will be observed, is somewhat above the estimated mortality in the London Hospitals, MacCormac's figures for these being 12.8 per cent.] Of these amputations Erdmann tells us that 196 were of the upper extremity and 507 of the lower extremity. The highest mortality followed amputation at the hip, 18 cases, with 8 deaths, or 44 per cent. There were 24 amputations of the shoulder, with 6 deaths, 25 per cent. Of the entire number of deaths, 31, or about 29 per cent., were due to operative shock; 1 death was due to secondary hemorrhage, 3 were due to septicemia following the operation, 3 were due to nephritis and pneumonia, and 1 was due to mercurial poisoning.

Shock.—The topics taken up for discussion in the debate were gangrene of the flaps, secondary suture, duration of treatment, shock, drainage, and dressings. [There is one point worthy of reference as to shock, that whereas the general view that the nearer to the body the amputation is performed the greater will be the shock may be accepted as true, the mortality depends as much upon the size of the limb at the site of section as it does upon the nearness to the body of the limb. The shock may be greater when a thick part is amputated comparatively low down than when a shriveled limb is amputated comparatively high up.]

The Method of Amputation.—[The question of the most desirable method of amputation is involved in considerable contradiction. Many authors advocate the modified circular amputation for most regions in the body, in which procedure the flap is secured from the skin and subcutaneous tissue. The resultant difficulty is that a skin-flap seems more liable to slough than does a muscle-flap, except in regions adjacent to joints, in which situation it is thoroughly well nourished by free anastomotic circulation. Hence in regions near joints the modified circular is a desirable operation. A flap composed partly of skin and partly of muscle seems in most instances to be the most desirable amputation, except, possibly, in the neighborhood of joints. The surgeon should be careful not to include too much muscle in his flap. Too much muscle is liable to necrose, and in this debate Abbe showed that flap-gangrene may be due to too tight suture, and too much muscle makes too tight suturing almost inevitable. The skin-muscle flap is preferred by both Abbe and McBurney. Secondary suture had warm advocates, but secondary suture, as McBurney showed, is veritably drainage unless it is used to permit of pressure, as is suggested by Wyeth in amputation at the hip-joint, when profuse oozing occurs after ligating the chief vessels. It will be recalled

that Wyeth suggests that when flaps are found to show profuse capillary oozing, the wound should be filled with aseptic sponges or bits of gauze, that sutures should be lightly applied, that pressure should be made upon the flaps, and the sutures tightened on the following day, when the pads of gauze are removed.]

Sloughing after Amputation.—Bogdanik¹ writes upon a method of preventing sloughing of the skin after amputations of the leg. He amputates with a short anterior and a long posterior flap, closes his wound with a continuous suture, and inserts a drainage-tube. He then picks up a fold of skin in front of the tibia and parallel with this bone, and passes a needle threaded with chromicized gut from the inside to the outside and then back again and higher up. The ends are tightened and a fold of skin is thus furrowed over the sharp edge of the same bone. [If the tibia is beveled, as should be the invariable rule, Bogdanik's procedure becomes entirely needless.]

Modification of Pirogoff's Operation.—Le Moyné² sets forth a modification of Pirogoff's amputation. He retains the extremities of the tibia and fibula in order to avoid considerable shortening, which he says is necessitated by the original Pirogoff amputation. The section of the os calcis is wider than the intermalleolar space, and an excavation must be made on each side, corresponding to its respective malleolus, and the parts accurately fitted to each other. [We would note upon this subject that when Pirogoff's amputation is properly performed it does not shorten the limb to any appreciable extent. One of the objections to this operation is that it leaves the limb a trifle too long (Bell). Furthermore, we consider it bad policy to apply sawn bone to unsawn bone for the purpose of securing union. The general view of the profession certainly is, that whereas Pirogoff's amputation frequently gives a good stump, and may be suitable for certain traumatisms, it is rarely advisable in cases of bone-disease; furthermore, it not unusually gives a painful scar, the flap not rarely sloughs, and the remnant of os calcis may necrose.]

Amputation in Infantile Palsy.—Cesor³ defends amputation in old cases of infantile palsy. He draws the following conclusions: 1. In this condition the functions are profoundly interfered with. 2. The extremities are the seat of lesions, such as trophic ulcers, arthropathies, multiple fractures, etc. 3. Poncet was correct when he asserted that amputation is justified by the functional impotence and the nutritive disorders. 4. Amputation is especially applicable in the lower extremity. 5. In cases of double atrophy of the lower limbs, double amputation (though not done synchronously) will allow the patient a better chance to move about than when two useless limbs hang to him. 6. Amputation of paralytic arms is

¹ *Centralbl. für Chir.*, No. 21, 1894.

² *Phila. Polyclinic*, Aug. 4, 1894.

³ *Lyon médical*, July, 1894.

often indicated, and the operation through unsound tissue has, by modern methods, been rendered far less dangerous than formerly. [In many cases of paralytic flail-joint, Jones of Liverpool has secured useful limbs by the operation of ankylosing the ankle-joints and knee-joints, and this operation, if feasible, should always be undertaken in preference to amputation. See page 276.]

Disarticulation of the Knee-joint.—Delorme¹ discusses the subject of disarticulation of the knee-joint, and approves of the method by means of a raquette incision in which the cicatrix falls posteriorly between the condyles. He does not disturb either the condyles or the patella. In the debate that followed, Poncet stated that he was perfectly satisfied with the value of disarticulation through the knee-joint; patients could walk admirably and bear the weight of the body upon the condyles without pain. [The operation of disarticulation has been largely abandoned because of its high mortality. In the preantiseptic days the synovial pouches suppurated, the cartilage necrosed and took a very long time to exfoliate, the flaps not unusually sloughed, and the stumps were extremely tender. Antisepsis has profoundly altered our view. Furthermore, this operation has the advantage of not cutting certain important muscular attachments and of not opening the great muscular planes of the limb. The stump bears a great amount of pressure and the medullary canal is not opened. We should leave the patella and should not interfere with the condyles. We should leave the semilunar cartilage, as Brinton showed in 1872, for this prevents retraction of flaps and projection of the condyles. A most useful artificial leg can usually be worn after this operation. Few stumps will be tender, though occasionally the artificial legs must have pelvic support (3 out of 14 cases recorded by Habs). There is one danger not mentioned in the textbooks in regard to amputation of the knee-joint, which seems to be a real danger, and that is the not infrequent occurrence of secondary hemorrhage. Habs has recently strongly advocated disarticulation at the knee-joint in preference to a low thigh-amputation, and it will be recalled that Prof. Hagedorn regarded the operation with high favor.]

Amputation at the Hip-joint.—F. T. Paul² reports seven successful cases of amputation at the hip-joint, in which he prevented hemorrhage most satisfactorily by the use of Esmarch's band, prevented from slipping by a bandage over the shoulder and one across the opposite hip, after the methods of Moore, Volkmann, and Esmarch. [There seems to be a disinclination upon the part of some surgeons to use Wyeth's pins. There certainly can be no doubt that in many cases of hip-amputation and shoulder-amputation it is entirely possible to prevent hemorrhage by the use of the method of Moore. Nevertheless, in applying the Esmarch band after this method we are liable to have slipping down of the band during application, and great

¹ Bull. et Mém. de la Soc. de Chirurgie, 1894, p. 128.

² Lancet, Jan. 26, 1895.

care in position and slowness of adjustment are necessary. Greater rapidity of application and certainty of retention can be attained by the use of the pins. The exact point of passing the pins is of importance. One pin should be put in below and to the inside of the anterior superior spine of the ilium and should be brought out posterior to the great trochanter. Another pin should be inserted below the crotch and internal to the saphenous opening and be brought out anterior to the tuberosity of the ischium. The amputation has been performed at the hip and shoulder after the application of one pin, but this was shown in a case recorded by Dr. Allis to offer a certain danger in itself. In a case of amputation of the shoulder-joint he applied one pin and threw a band above the pin. On disarticulation of the shoulder-joint the axillary artery slipped up within its sheath and became lost in the flap. For the reason, then, of security it is far better to use two pins. These pins, for a shoulder-joint amputation, must be accurately applied. The anterior pin is inserted at the middle of the anterior axillary fold and is brought out one inch internal to the apex of the acromion; the posterior pin is inserted in the middle of the posterior axillary fold and is brought out one inch internal to the apex of the acromion, carefully avoiding the spine of the scapula. When the pins are thus inserted the axillary artery is not compressed by the band against the head of the humerus, but is compressed against the thorax itself. The pins should have triangular points to facilitate their passage, and after their passage each pin should be stuck into cork.]

Buechner¹ discusses the various operations for amputating at the hip-joint and asserts that the operations of Senn and Wyeth are modifications of methods already known, the original method being that of Volkmann. He describes the operation of Volkmann as follows: The leg is emptied of blood; an Esmarch tube is applied close to Poupart's ligament, and is prevented from slipping by two or three bits of bandage held by an assistant. A circular amputation is performed, all vessels are secured, and the tourniquet is removed and the remaining bone is disarticulated through a long external incision by blunt dissection. This operation he says is entirely bloodless, and in the majority of cases the use of Wyeth's pins is unnecessary. [Wyeth himself, in discussing amputation at the hip-joint, advises that the operation be performed by the following incisions, which, he says, are practically those of Dr. Walter Brashear of Kentucky: A circular incision is made six inches below the tourniquet, and this is joined by a longitudinal incision commencing at the tourniquet and passing over the great trochanter. This cuff of subcutaneous tissue and skin is dissected off as high as the tourniquet. At the level of the lesser trochanter all the soft parts are divided by a circular cut down to the bone. The soft parts are cleared from the femur for several inches below the line of the divided muscles, in order to

¹ N. Y. Med. Rec., Dec. 16, 1893.

facilitate the search for the vessels. The larger vessels, veins as well as arteries, at this stage should be tied, and disarticulation is then effected.]

Amputation with Reference to Artificial Limbs.—G. E. Marks¹ considers amputations prothetically, and maintains that an amputation in the tarsus or at the tarsometatarsal junction, by the method of Chopart, of Lisfranc, of Hancock, or of Hey, produces a stump that can be perfectly fitted with an artificial leg. He says that in every partial foot-amputation contraction of the Achilles-tendon must be prevented. As a rule, this object can be attained by the use of a suitable splint, but if the splint fails to accomplish the purpose, either tenotomy or fixation of the ankle-joint must be resorted to, for if the heel is allowed to draw up and the amputating surface be permitted to point downward, the individual will be obliged to have an artificial leg applied that will not touch but will shield the amputated surface; that is, he must have a thick sole and heel worn on the well foot. [We recall that Truax, who has had an experience of 14,000 cases in fitting artificial limbs, holds that tarsal amputations are usually followed by pes equinus because of tendon-contraction, and that he greatly prefers to fit an artificial leg upon a stump when there has been an amputation at the junction of the lower and middle thirds of the leg or of the middle and upper thirds.] In the foregoing article Marks makes some valuable suggestions in the following vein: He says a stump, before it is called upon to perform the functions of operating an artificial limb, is likely to accumulate fatty tissue and so to become large and edematous. In order to limit or prevent this condition, bandages should be applied from the time the stump has healed until the artificial limb is applied, and these bandages should be tolerably tight without interfering with the circulation. He further says that it will be entirely safe to apply an artificial leg to a stump that has followed an amputation for accident soon after the healing of the stump and the restoration of the patient to his normal health. Nothing in the world is to be gained by waiting beyond that time, as waiting allows the stump to become enervated from disuse. He says that in a stump resulting from amputation for disease, especially malignant disease, the patient should be obliged to wait for a considerable time before applying an artificial leg. No artificial leg is applied until it is reasonably certain that the pressure and confinement and the shock of walking will not excite a recurrence of the disorder. A child who has lost a leg is never too young to have an artificial leg applied. [These views of Marks seem to us to be sound and practical.]

Neuralgia in Stumps.—Witzel² holds that neuralgia in amputation-stumps is not caused, as is usually believed, by the formation of neuromata at the ends of the divided nerves. In every nerve cut in amputation a neuroma forms at the end, and in only a few cut nerves is there neuralgia. He tells us that in order that the functions of a nerve may be performed

¹ N. Y. Med. Jour., Jan. 27, 1894.

² Centralbl. f. Chir., April 6, 1894.

properly the nerve must move freely in its sheath. The ordinary movements of the near-by joints would interfere with the functions of the nerves if these nerves did not have a free range of movement. In some cases after amputation the neuromatous enlargement of the nerve becomes firmly anchored to the end of the bone by tough cicatricial tissue, so that every movement of the stump at the nearest joint stretches the fixed nerves, and these are the cases in which neuralgia exists. As a preventive treatment Witzel recommends that in every amputation the nerves should receive as much attention as the arteries and veins, and should be thoroughly pulled away from the flaps and cut high up.

Neudorfer's Method of Amputation.—Meisenbach¹ contributes his experience with Neudorfer's method of amputating extremities. This method he approves of, and considers its application in amputation and continuity.

Technique when One Bone is Divided.—The first step in the operation is to determine the point at which the bone is to be divided. For example, we will assume that we wish to amputate the thigh at the junction of the lower with the middle third. If the bloodless operation of Esmarch is employed, the limb is first rendered bloodless by the application of a bandage and constrictor. If the bloodless method is not employed, the vessels are controlled either by a constrictor or by the fingers of an assistant. Having determined the point where we wish to divide the bone, an incision is made with a sharp-pointed, strong resection-knife, extending downward, in the long axis of the limb, through the soft parts and periosteum. The incision should be made on the lateral or anterior aspect of the limb, where the bone is more superficial and where the larger vessels and nerves are avoided. In the thigh the incision should be made about twelve centimeters in length, or about four and a half inches. With large-sized retractors the soft parts are held apart. The periosteum is now thoroughly loosened from the bone in the line of the incision with a raspatory. With the chisel the bone is cut through at the upper angle of the wound (line for division), as in an osteotomy. The lower fragment is luxated through the slit in the periosteum and the membrane (periosteum) carefully stripped from the bone.

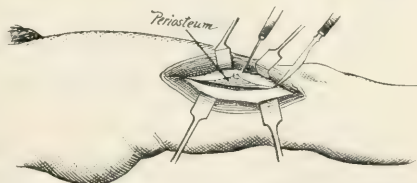


Fig. 1.—Neudorfer's method of amputation, first step: incision through soft parts and periosteum; soft parts held apart by retractors; periosteum incised and elevated from bone (Annals of Surgery, Sept., 1894).

“The soft parts are now divided at the site of the lower angle of the wound, in one place cut transversely to the axis of the limb with an ampu-

¹ Annals of Surgery, Sept., 1894.

tating-knife, scalpel, or even with a large pair of scissors. The vessels are next secured by ligatures. Having secured the vessels, the periosteum is stitched together with a fine catgut, continuous, buried suture, both longitudinally and transversely, obliterating the cavity of the periosteum that was occupied by the bone. The muscles are now united by a continuous, buried, catgut suture, and, finally, the skin in the same manner.

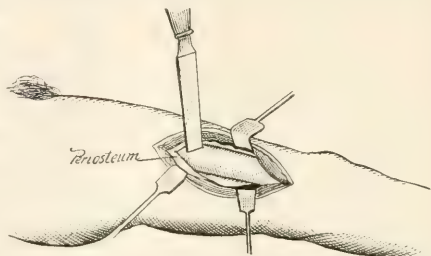


Fig. 2.—Neudorfer's method of amputation, second step: soft parts and periosteum retracted; chisel in position for osteotomy in upper angle of the wound (*Annals of Surgery*, Sept., 1894).

“In amputations of

the upper arm the incision is made on the outer aspect of the limb, and is to be about 6 cm., or $2\frac{1}{4}$ or $2\frac{1}{2}$ in., in length. The other steps in the operation are the same as described for amputations of the thigh.

“*Technique when Two Bones are to be Divided.*—The same technique is carried out in amputations of the leg and forearm, with the exception that an

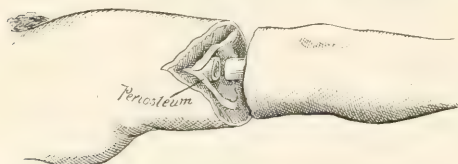


Fig. 3.—Neudorfer's method of amputation, third step: osteotomy of bone at upper angle of wound; circular division of soft parts at lower angle of wound (*Annals of Surgery*, Sept., 1894).

osteotomy of two bones must first be made before the soft parts are cut through. In the forearm the incision is made over the middle of the ulna and radius on the dorsal side, 6 cm. in length. Here the bones are very

superficial. In making the incision the arm should be kept midway between pronation and supination. For amputations of the leg the incision is made over the tibia, at the point selected, either on the inner or outer aspect of the crest, and about 9 cm. in length. Neudorfer prefers the outer aspect. The tibia is first cut through with a chisel, then the fibula is divided either on the same plane or a little higher up. All the other steps are the same as already described, the only difference being that in amputation of the leg and forearm we have two periosteal cavities to obliterate and two skin-wounds, respectively, over the ulna and radius or over the tibia and fibula.”

Major Amputations.—Credé¹ discusses major amputations. He makes flaps composed of both skin and muscle, and uses neither drains nor sutures.

¹ *Arch. für klin. Chir.*, 1894, Band 48, Heft 3.

After removing the limb and ligating the vessels he places the flaps in apposition, and holds them in place by applying a moist gauze bandage. The bandage remains in place eight or ten days, when the deeper portions of the stump have healed. [This procedure seems to wilfully overlook the advantages of modern methods. It seems to be an attempt to secure perfect drainage, but satisfactory drainage can be obtained without the danger and delay

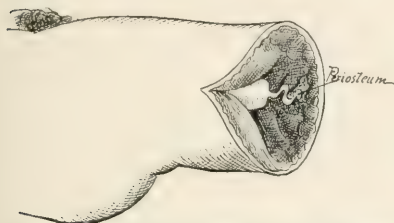


Fig. 4.—Periosteum, sutured muscles, and skin before coaptation by buried catgut suture (*Annals of Surgery*, Sept., 1894).



Fig. 5.—Perpendicular section of stump after periosteum, muscles, and skin have been united by continuous catgut suture (*Annals of Surgery*, Sept., 1894).

of what is practically an open wound. Credé only got primary union in two-thirds of 22 cases, and his own figures seem to refute his claims.]

TUBERCULOSIS.

Teucrin.—Teucrin has been strongly recommended in tuberculosis by Prof. Moosetig-Moorhof. Dr. Trzebiecki¹ presents an article upon the use of local subcutaneous injections of teucrin in a number of cases of cold abscesses, glandular suppuration, ulcers of the skin, and tuberculosis of bones and joints. He finds that teucrin sometimes benefits the tuberculous lesions, but the improvement is temporary and the disease rapidly recurs. The injection causes severe and persistent local pain; marked febrile reaction follows, associated with prostration, shivering, thirst, and violent headache.

Iodin.—Durante² claims that very valuable results have been obtained by him in the treatment of tubercular joint-disease, tubercular adenitis, and even in pulmonary tuberculosis, by the hypodermic injection of iodine in the following combination: from 1 to 5 parts of iodine, 10 parts of the potassium iodide, and 100 parts of distilled water; 1 c.c. of this liquid being injected each day, using first the 1 per cent. solution and gradually advancing to the 5 per cent. solution. A very few injections cause the fever to disappear and vastly improve the local condition. The injections of iodine should be continued for at least six months. These injections succeeded well in a case of tuberculosis of the kidneys and urethra in which all previous methods had failed.

Treatment of Tuberculosis by Congestive Hyperemia.—The treatment of surgical tuberculosis by congestive hyperemia (known as the method

¹ *Przegląd Lekarski*, Sept. 1, 1894.

² *Med. Week*, 1894, ii., p. 274.

of Bier) has claimed considerable attention during the year. Bier himself presents some further observations on this subject.¹ His conclusions² are that a large percentage of joint-tuberculoses heal under the treatment of congestive hyperemia. In other cases difficulties arise in the treatment, and the disease becomes worse. The aggravation is usually only apparent, and is due to—1. Tuberculous abscesses in closed lesions, that may be cured by puncture and the injection of iodoform-glycerol emulsion, and are not indications for resection. The abscesses usually are accompanied with symptoms of severe inflammation and disturbance of the function of the limb. They form rapidly, and must be diagnosticated and treated as soon as possible. Sometimes they occur without symptoms, and therefore examinations should be frequently made. 2. Hyperemic ulcerations and granulation-formation. The first heal when the congestion is relieved for a time and the limb is elevated and kept quiet and clean. The latter finally contract under the continuation of the hyperemia.

The foregoing are the apparent disadvantages. The following are real changes for the worse: 3. Acute inflammations complicating the tuberculosis and giving rise to "hot abscesses." These must be incised. The acute suppurative process may involve the whole joint-cavity. When this occurs the joint must be resected. Erysipelas may develop. In this case the hyperemia should be discontinued and the disease be treated as usual. The most rapid results are obtained by a combination of congestive hyperemia and iodoform-injections. During treatment the joint should be immobilized. If fistule remain after the tuberculosis has greatly improved, they should be treated in the following manner: (*a*) Iodoform-glycerol should be injected in the tissue about the fistula; (*b*) the congestive hyperemia should be discontinued, and the fistule injected with mercuric-chlorid solutions—preferably with cupr. sulph., zinc. sulph., $\bar{a}\bar{a}$. 10.0; distilled water, 120.0; (*c*) sequestra should be removed by operation.

The presence of large abscesses is a contraindication to the congestive treatment. Good results are obtained by congestive hyperemia in cases of tuberculosis of the testicle and in tuberculous tendosynovitis. This treatment is also applicable to chronic articular rheumatism, to arthritis deformans, to the sequelæ of acute articular rheumatism, and to those of gonorrheal arthritis.

Dr. Zeller³ of Berlin reports 12 cases that he has treated by Bier's method. In one case of tuberculosis of the carpus the result was very brilliant. In a case of tuberculosis of the knee temporary improvement was manifest, but amputation was eventually necessary. Two cases of tuberculosis of the elbow-joint were apparently aggravated by the hyperemia. Two

¹ Verhandl. der deutsch. Gesellsch. f. Chir., XXIII. Congress, 1894.

² Epitomized in *The Annals of Surgery*, 1894, p. 479.

³ Verhandl. der deutsch. Gesellsch. f. Chir., XXIII. Congress, 1894.

knee-joints and two cases of tuberculosis of the tarsus were treated with the addition of iodoform-injections, and the results were admirable. He cited the case of a young girl who presented scarcely an indication of the disease and who had an almost perfectly movable knee-joint, whom he had cured in five months. He also showed a seven-year-old boy in whom he had cured tuberculosis of the knee-joint. Zeller's conclusions are that congestion always quickly diminishes the pain, but that after a time the favorable effect upon the case ceases, and then, if the congestive hyperemia alone is continued, the patient grows worse—that is, either abscesses form or the disease extends inside and outside of the joint. Zeller believes that the treatment by congestive hyperemia should have associated with it other methods, such as injections of iodoform and immobilization of the joints. Iodoform acts more quickly and more certainly in hyperemic than in nonhyperemic tissue.

Iodoform-Oil in Tuberculous Joints is the title of a thesis by De Vos¹ in which he advises the following points as suitable spots for injecting various joints:—*Shoulder*: One cm. below the tip of the acromion, while the arm is adducted and the forearm is bent at a right angle across the abdomen. *Elbow*: At the outer side of the olecranon, the needle passing between the olecranon, the head of the radius, and the capitellum of the humerus. *Wrist*: At the dorsal edge of the radial styloid and at the upper edge of the pisiform bone. *Hip*: Take the middle of a line from the anterior superior spine of the ilium to the pubic spine. Draw a line external to this point the width of the patient's thumb. From this point draw another line to the outer edge of the great trochanter. The needle is inserted at the junction of the outer and second fourths of this line, the limb being extended, the foot vertical, and the trochanter in its normal relation to Nélaton's line. *Knee*: The angle between the outer edge of the patella and the ligament of the patella. *Ankle*: In front of the tip of the external malleolus.

Injections are made slowly. The initial dose for adults is 5j of iodoform in a 10 or 20 per cent. emulsion. In one week, if there is no reaction, the injection is repeated, then again in fourteen days, and again in twenty-one days. The guides to internal treatment are the presence of iodine in the urine and the existence of persistent tenderness in the joint. In after-treatment avoid massage and passive movements, but moderate active movements are permitted. Iodoform-oil is better than iodoform with glycerol or with ether: 72 per cent. of cases are cured. Intoxication may occur. Cases require from one to twenty injections. Treatment lasts for from nine to three hundred and twenty-five days.

[Charles S. Potts, in the Hospital of the University of Pennsylvania, has recently made some observations of great importance upon the introduction of iodoform into tubercular joints by the action of the galvanic current. A saturated solution of iodoform in alcohol was used, and it was applied all

¹ Am. Med. and Surg. Bull., Aug. 15, 1894, from Centralbl. f. Chir.

over the outer surface of the joint every other day by means of Peterson's electrode. The current-strength was from 3 to 5 milliamperes. In one case of tubercular synovitis, in which various plans of treatment had failed, thirty applications by this method abolished swelling and pain and greatly diminished stiffness. In this case iodine appeared in the urine. This method is safe and seems to promise much.]

The Diagnosis of Tubercular Disease of the Sacroiliac Synchondrosis.—A. G. Miller¹ contributes a most instructive article on this subject which is worthy of study. We would call especial attention to the following table :

TUBERCULAR DISEASE OF SACROILIAC SYNCHONDROSIS.	TUBERCULAR CARIES OF LUMBAR VERTEBRÆ.	TUBERCULAR DISEASE OF HIP-JOINT.
I. General symptoms of tubercular disease.	General symptoms of tubercular disease.	General symptoms of tubercular disease.
II. Slight limp; can stand on either foot, lifting the other from the ground.	No limp, but attitude awkward; can stand on either foot.	Marked limp; cannot stand on affected limb.
III. No flexion at hip, except when iliac abscess.	No flexion at hip, except when psoas-abscess.	Marked flexion of affected hip-joint, with abduction or adduction.
IV. Fulness rather than flattening of gluteal region; natal fold slightly altered.	No flattening of gluteal region or alteration of natal fold on one side more than the other.	Flattening of gluteal region and loss of natal fold on affected side.
V. Pain on pressure over synchondrosis, and on pressing ilia together.	Pain on pressure over lumbar spines and on pressing shoulders down on spine; "splinting" of lumbar region; alteration of lumbar curve.	Pain at hip-joint, on pressure on trochanter, knee, etc., and on movement of affected limb.
VI. Abscess over synchondrosis or in iliac fossa.	Lumbar or psoas-abscess.	Abscess in neighborhood of hip-joint.
VII. Treatment by rest, extension, counter-irritation, Thomas's hip-splint.	Treatment by jacket, etc.	Treatment by rest, extension, or Thomas's splint.

Tuberculosis of the Breast is the title of an article by Charles A. Powers.² He reports the case operated upon by Bull nine years ago, reviews the literature of the subject, and finds 35 recorded cases, of which 34 were in females. Of the 34 women, 22 were married, 21 of the 22 had borne children, and 6 had had suppurative inflammation of the breast, while 3 had had inflammation without suppuration. It becomes evident from these figures that the puerperal state and lactation predispose to the disease. The tuberculous breast may be larger or smaller than normal. It may look natural, or may be perforated with fistulæ. There may be a single fluctuating area, or many small foci, and the skin over these diseased areas may

¹ Edinburgh Med. Jour., May, 1895.

² Annals of Surgery, vol. xx., No. ii., 1894.

be either normal or discolored. There may or may not be glandular involvement in the axilla, and there may be fistulæ in the axilla. The attention of the patient is usually first attracted either by the discovery of a lump in the breast, by a feeling of distention, or by pain. The lumps grow very slowly and may remain apparently stationary for a long time. After fistulæ form they do not tend to heal. This fact differentiates them from the fistulæ of nontuberculous breast-inflammation. The diagnosis can be made certain only from microscopic investigation. Powers says that in certain advanced cases the clinical diagnosis will probably be correct. He supposes a woman of spare form and tuberculous appearance, who has had a history of glandular enlargements or of joint-tuberculosis in her youth, or who presents at that time pulmonary tubercle; if such a woman have a suppurative breast, which suppuration is of long duration and eventuates in the formation of fistulous tracts and the involvement of the axillary glands, a diagnosis can be made. Since the recorded cases prove that in most instances a large portion of the breast-tissue is infiltrated with disease, and that the axillary glands are likewise implicated, the proper treatment is to remove the entire breast and the axillary contents. Opening of abscesses and curetting the walls of fistulæ may, it is true, in a few instances be productive of cure, but recurrence will probably take place. The rule should be to explore the axilla after incision, even though nothing is detectable on palpation. There is a very strong tendency to infection of the lungs in tuberculosis of the breast. Local operative treatment should have added to it the advantages of proper climatic and hygienic conditions. [There can be no doubt that a tuberculous breast should be extirpated and that the axilla should be cleared out.]

General Observations Upon Surgical Tuberculosis is the title of an excellent article by George Ryerson Fowler,¹ in which he discusses many points about the disease, the views of the older physicians, the relation of tubercular and scrofulous lesions, and the isolation of the specific agent of the disease. In regard to the manner in which the bacillus finds entrance to the body, he thinks that it is more probable that it takes place by contagion than by heredity. He says the older physicians were familiar with numerous instances in which those who were in direct contact or close attendance upon tuberculous patients developed the disease. In all probability, the disease is usually conveyed through the medium of the air, not so much by the air exhaled by the victims of pulmonary tuberculosis as by the air charged with bacilli and spores arising from dried sputa or suppurative cheesy masses. There is no question but that the disease may be transmitted through the medium of the meat and milk of tuberculous animals, and likewise from the bacilli deposited with pus upon food which is subsequently eaten. Wounds of the skin furnish a way by which infection can take place. Many instances of this are upon record. Other points of

¹ Brooklyn Med. Jour., Aug. and Sept., 1894.

infection that have been pointed out are the granulation-tissue in an operation-wound, chronic ulcers of the leg, chronic dermatitis, etc. It is probable that some of the skin-lesions of patients suffering from tuberculous disease of the bones with discharging sinuses are the result of infection through the medium of carelessly handled dressings. Lupus-disease in the neighborhood of a tuberculous sinus has been noted by many observers. The site of first infection in tuberculosis becomes the focus of granulating inflammation that spreads at the periphery while the center undergoes caseous degeneration. From these points the bacilli invade adjacent lymph-glands, in which granulation and cheesy degeneration rapidly follow. Invasion of lymph-glands may occur as soon as any inflammatory condition, demonstrable by the microscope, has taken place at the point of original infection. After the lymph-glands have been attacked the bacilli spread from them with comparative slowness. General infection occurs in the form of miliary tuberculosis, brought about by the introduction of the infecting agent into the circulation through the medium of the lymphatic channels, and possibly by the growth of bacilli in the veins. Fowler says, in view of the fact that one-seventh of the population of the temperate zone die from tuberculosis, and that a considerable portion of the infecting agent must always exist in the atmospheric air, it would seem as if a larger percentage of persons should become infected with the disease. This does not occur because of—1. An absence of individual predisposition. 2. The absence of inherent power of movement on the part of the bacillus. 3. The slow growth of the bacillus, which often causes it to be overcome by other rapidly-growing germs. 4. The purely parasitic nature of the bacillus, and the fact that, although the spores are resistant to ordinary destructive influences, yet great numbers of them are prevented from developing in the presence of saprophytic organisms that develop in masses of organic material. Fowler greatly doubts the existence of hereditary predisposition. In many instances, he says, this supposed hereditary predisposition is an acquired one, and results, especially in children, from their environment. The age of the patient has some bearing upon the liability to the disease. Gland-tuberculosis is most frequent between the ages of three and twelve. Tuberculosis of the skin, bones, and joints is more common during the years of adolescence. Pulmonary tuberculosis is most common up to the twenty-fifth year. Whether or not all of the so-called scrofulous affections are due to the presence of the bacillus is in doubt. In those instances in which the germ has been found upon the surface in chronic eczema, it has not been proved that its presence was not a mere accident. Of tuberculosis it may be said that tubercular infections require radical local means for the destruction of the infectious agent, and for the removal of the degenerated structures resulting from the presence of this agent. Fowler goes on to consider the various means that may be employed for these purposes. Tincture of iodine, he says, pro-

duces excessive reaction and pain, and its employment should be limited to simple serous or catarrhal synovitis. It should never be permitted to remain long in the joint, but should be allowed to escape quickly after it has been brought into thorough contact with the articular surface. Phenol has been employed by Heutter hypodermically and as an intraarticular injection. Although some brilliant results were obtained, especially in osteomyelitis, the use of phenol has been practically abandoned. The use of arsenious acid was attempted, but Landerer's results were not satisfactory. Mercuric chlorid has not proved successful when used locally or when injected into tubercular joints. Acidulated solutions of iron phosphate have been employed without success in the Tübingen clinic. Injections of zinc chlorid have, in the hands of Lannelogue, proved of benefit, especially in cases of lymphangitis. This drug seems to possess the power of converting softened tissues into hard fibrous structures. The injection is made into the periphery of the lesion, so as to stimulate healthy structures to cell-proliferation, thus encapsulating the tuberculous focus. Ten drops of a 10 per cent. solution have been injected with benefit into the upper recess of the knee-joint through several punctures. Balsam of Peru has been studied by Landerer to determine its antitubercular action. No specific effect was discovered, but it was shown that it places the parts with which it is in contact in such a condition that the pathogenic action of the tubercular bacillus cannot harm them. It is used for the treatment of fistulæ and deep-seated processes, and is often employed for parenchymatous injection. In fistulæ a 1 : 5 solution of balsam in ether is employed, and for parenchymatous injections a 1 : 4 emulsion with oil of sweet almonds, and a 0.07 solution of sodium chlorid. Vamossay recommends the use of gauze prepared with balsam of Peru as a dressing after operations for the removal of tubercular products. The use of too large amounts of balsam over large wounds may produce toxic symptoms, such as cystitis, albuminuria, and acute nephritis. Camphorated naphthol possesses valuable antiseptic properties, and has been used in tubercular abscess with favorable results as an injection in amounts of from an ounce and a half to two ounces. After erosion of a joint or curetting a tubercular abscess, dressings impregnated with camphorated naphthol serve all the purposes of an antiseptic as well as a bactericidal application, while speedy healing and freedom from relapse follow. Iodoform exerts a most positive influence over the progress of tubercular affections. In spite of the varying results of experimentation as to the action of iodoform upon tubercular foci, clinical results have been positively and unfailingly favorable. In bones that can be reached by the knife and curet, the cavity should be filled with coarse crystals of iodoform. In cold abscesses, after emptying out the caseating mass, curetting the walls, and rubbing them with sterilized cheesecloth or gauze, sterilized 10 per cent. emulsion of iodoform and glycerol should be thrown into the cavity, the superabundant portion being forced out and

compression and antiseptic dressings being applied. In many cases of joint-tuberculosis the progress of the disease may be arrested by parenchymatous and intraarticular injections of iodoform-emulsion. If the joint-cavity contains much synovial fluid or if it contains tubercular pus, it should be thoroughly washed out with a 5 per cent. solution of boric acid before the iodoform is introduced. These injections should be made not oftener than once a week, and during the interval the limb should be kept at rest. As soon as improvement becomes decided immobilization is abandoned. If after three or four injections there are no signs of improvement, the treatment should be given up. Even if this treatment should fail, nothing has been lost, but, on the contrary, the preliminary injection of iodoform into the joint-cavity prepares the joint and the tissues for any operation that may be necessary.

Cinnamic acid has been introduced by Landerer of Leipsic as an anti-tubercular agent, and the clinical results have been distinctly favorable. Experiments showed that the action of cinnamic acid is not so much upon the tubercle bacilli as upon the granular mass resulting from their presence. The same effects occur whether the cinnamic acid is brought in contact with the disease by direct applications—such, for example, as the injection of a 5 or 10 per cent. solution of glycerol into a tuberculous abscess—or through the medium of the circulation, by intravenous injections of a 5 per cent. watery solution of the sodium cinnamate. Intravenous injections should be made into the cephalic vein, subcutaneous injections into the gluteal muscles. In joint-tuberculosis injections are made into the fungous mass and into the joint-cavity. In lymphatic tuberculosis broken down tissues are removed by the curet, the cavity is treated by balsam of Peru, and the surrounding structures by cinnamic-acid injections. Tuberculous abscesses are incised, emptied, washed out with a solution of sodium chlorid of a strength slightly above the normal, and then injected with a 5 to 10 per cent. solution of cinnamic acid in glycerol, the quantity employed varying with the size of the abscess. As much as 30 c.c. of this solution may be used with safety. Lupus is treated by injecting the nodules with a 5 per cent. solution of cinnamic acid and alcohol. Tuberculous fistulæ are treated with the same solution.

Fowler discusses Bier's method of treatment by means of hyperemia due to venous obstruction, and quotes Mikulicz to the effect that this treatment ameliorates the pains of joint-tuberculosis, and if this amelioration is noted within the first four or five days the case is favorable for treatment, but that if in from eight to fourteen days this amelioration is not noted, but if, on the contrary, the pains are increased, the case is not suitable for treatment by this plan. An encircling band made of elastic material is placed around the limb a few inches above the affected part, and this band produces just sufficient pressure to cause venous congestion and more or less continuous hyperemia of the limb at and a little below the site of

disease. The patient does not keep quiet, but is encouraged to use the limb. The portion of the limb below the affected area is wrapped in a cotton or flannel roller, so as to limit the congestion as much as possible to the area of disease and in order to prevent edema. In order that the band may be worn continuously it should be at least three inches broad, and several thicknesses of lint should be placed beneath the bandage to protect the skin. The point of pressure may vary from time to time. Some surgeons employ fixation of the parts in addition to the elastic band and also remove the band at night. Fowler says that this treatment is based upon the old belief that cyanosis is incompatible with tuberculosis. He thinks that Bier's method enhances the processes of reaction in the diseased tissues, and thus gives to the latter the increased vital force that is necessary to overcome the bacillus. Whether the congestion so modifies the germ as to produce an antitoxic effect is a mere matter of speculation. It is quite probable that the favorable effects sometimes obtained from snugly applied plaster-of-Paris bandages and other apparatuses of a fixed character are really due to the hyperemic conditions that they produce. Some patients can wear this bandage for only a few hours at a time, while others do not complain of pain although the band has been applied for a long period. The method may be carried on in conjunction with other treatment—for instance, the use of fixation-apparatus, or the employment of intraarticular or parenchymatous injections of cinnamic acid or iodoform.

[We dissent from Fowler's view that a predisposition to tuberculosis cannot be inherited.]

The Treatment of Tubercular Abscess is the title of a paper by Wm. J. Taylor.¹ He says the best method of treating tubercular abscess arising, for instance, on the basis of a hip disease is a subject of great importance. There are three plans of treatment: the first is that of doing nothing surgically, simply sitting by and allowing the abscess to do as it likes. Those who advocate the expectant plan claim that the place of spontaneous discharge is the most favorable point for drainage, that the wound is smaller, and that the prospect of rapid closure is better. The second plan is that advocated by those who believe that nothing should be done until the abscess is large and its walls are thin. At this stage they aspirate, wash out the cavity with some antiseptic fluid, and inject with a solution of iodoform and glycerin. It must be remembered that this procedure is not without danger to the life of the patient, and that the injection of iodoform into a closed cavity may produce violent poisoning. The author's own experience has not been such as to encourage him in the use of this method of treatment. The third plan is the one which the author prefers—that is, to treat the abscess on true surgical principles, just as we would a collection of pus of any other form, but with the understanding that we are dealing with a condition in which

¹ *Annals of Surgery*, July, 1895.

there are no germs of putrefaction. This treatment is by free incision, thorough curetting of the walls of the abscess-cavity, while the wound is being flushed with plain boiled water flowing into the wound and washing out the broken granulations and shreds of tissue. This plan is useful in all forms of tubercular abscesses. The incision should be closed by Halsted's subcuticular suture of silver wire. If the abscess is very large, and it is found impossible to reach every part of the cavity with a curet, a drainage-tube should be introduced for the first twenty-four hours. Even if primary union be not secured by this method, we thoroughly clean out the abscess-cavity, with the certain removal of the majority of the tubercle bacilli, and at the same time lessen the size of the abscess-cavity, diminish the amount of the wound-discharge, and enable healing to take place with great rapidity. This is the most satisfactory method of treatment. [The operation as performed by Taylor was, we believe, introduced by Halsted, and has been performed by him with great success. The use of boiling water for tuberculosis has been found of value. It was recommended by Jeannel of Toulouse. In an abscess, scrape away the granulations, fill the cavity with boiling salt water, sponge out, refill it, and so on a number of times. The cavity can be closed and primary union sought for. Another method is to fill the cavity with warm water, and make it boil by the thermocautery, filling up the cavity as soon as the water evaporates, and repeating this four or five times. Boiling water may be used for tuberculous joints and ulcers.]

CYSTS AND TUMORS.

Traumatic Dermoid Cysts.—Le Fort¹ discusses the subject of traumatic dermoid cysts, and tells us: 1. That they occur almost exclusively in the hand and in the iris. 2. That they arise in the hand from fragments of skin forced into the deeper tissues by the instrument that inflicts a wound. 3. That the displaced portion of skin is very small and composed only of epidermis. 4. The conclusion is obvious that traumatic dermoid cysts are usually purely epidermic. 5. The greater frequency of these cysts in the region of the hand is due to the readiness with which epidermis can be detached from the hand and also to the liability of this part to injury. 6. The displaced portion of skin may still maintain some connection with the skin of the hand and with the vessels, nerves, and glands of the skin, a fact that explains those cases in which the walls of traumatic cysts show papillæ and even hairs. 7. In some cases the fragment of skin may contain a portion of the dermic layer. 8. In every case the fragment forms a small part of the wall of the cyst, the rest of this wall being formed by cicatrization that started from the edges of the growth; and as the wall formed by cicatrization contains neither glands nor papillæ, the epidermis is invariably in direct contact with

¹ Rev. de Chir., Dec., 1894.

connective tissue, hence it is necessary to make an extremely careful and thorough removal of the growth.

The Treatment of Hydatid Disease is the title of a very able article by Gardner,¹ who says that tapping is contraindicated in most hydatid cysts because of the risk of death from shock, and because such treatment makes the conditions less favorable for subsequent major and radical operations. He believes in radical operation by incision and immediate removal in the following cases: 1. In all hydatid cysts of the external surface of the body the sac ought to be dissected out exactly as is a tumor, and the wound should be closed. In cases in which obviation of scarring is important, as in the breast and neck, small openings may be made, and the wound in the cyst be either sewn up or drained. 2. In all unruptured hydatids of the lung the radical operation should be at once performed, because of the great risk which attends spontaneous rupture (spontaneous rupture may be caused often by the introduction of even a hypodermic syringe of fluid). 3. In all cases of hydatids of the lungs in which spontaneous rupture has occurred and in which the patient has escaped flooding of the lungs and choking of the glottis with membrane, the surgeon may wait, but if a suppurating cavity be left one or more ribs should be partially resected and the cavity drained at its lowest point. 4. All hydatid cysts of the abdomen should be subjected to the radical operation whether they are suppurating or not. When drainage is required we should use iodoform-gauze, and when skilled assistants can be obtained we should stitch the cysts to the parietal peritoneum, empty the cyst and, fixing it firmly to peritoneum and muscle, douche until all the contents are evacuated. In some cases instead of drainage we can completely remove the fibrous sac. In Bond's operation, in which the cyst is closed by sutures and, after it has been evacuated, dropped back into the abdominal cavity, we should stitch the sac to the peritoneum on each side if the cyst can be brought up to the abdominal wound, but if it cannot be brought up to the abdominal wound it must be absolutely emptied, the hole in the sac must be carefully sewn up, and the cyst dropped back into the abdomen. Gardner tells us that tapping may be very rarely used in cases of doubtful diagnosis, but if it is used and the cause is proved to be hydatid cyst, immediate operation is indicated.

Rudall² tells us that the tendency to treat hydatid tumors by a radical cutting operation has become pronounced during the past few years. He says that sometimes serious symptoms ensue from aspirating or injecting a hydatid cyst. These symptoms are vomiting, collapse, and local peritonitis, and in some instances tapping has proved fatal. Never tap until everything is at hand ready for a radical operation at once if it be found necessary. Success is never to be expected from simple tapping when the cysts are suppurating or contain daughter-cysts. In either of the two latter conditions mentioned,

¹ Australian Med. Jour., Aug. 20, 1894.

² Australian Med. Jour., Jan. 20, 1895.

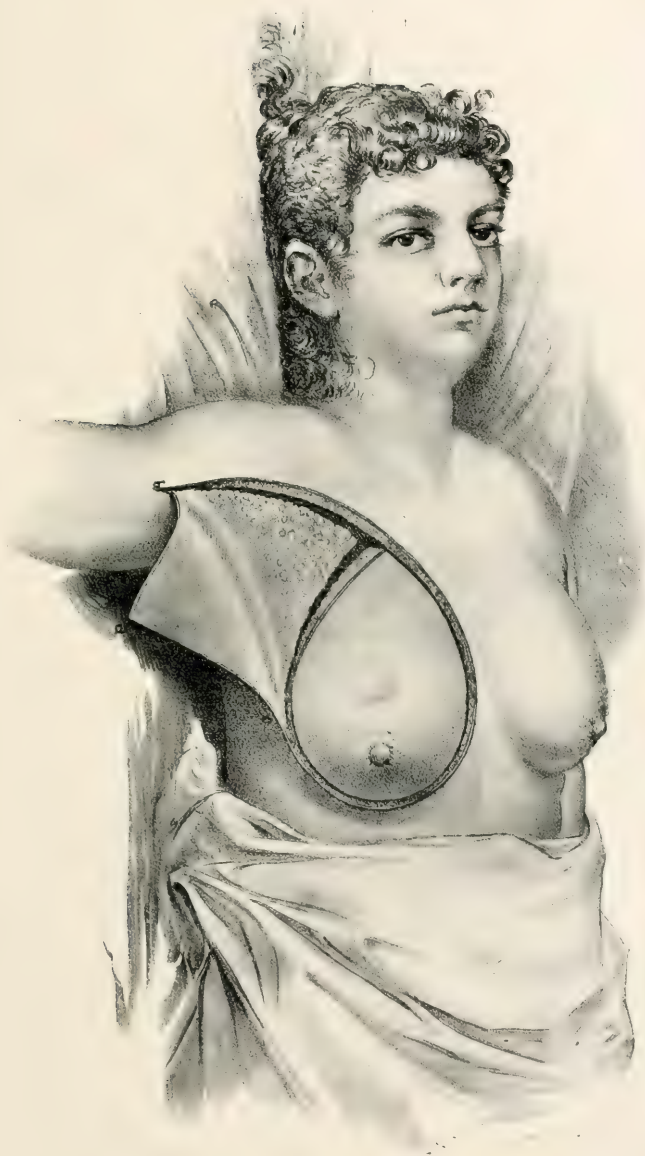
one of two methods is to be used, either incision of the cyst with evacuation of the contents and removal of the cyst itself, or tapping with a large trocar and cannula and leaving the cannula in the cyst for several days.

Feletti¹ claims that medical treatment is of some avail in hydatid cysts. He has administered the ethereal extract of male fern, and claims that cysts that were accessible to palpation rapidly diminished in volume, and in two cases completely disappeared. [We would simply mention this statement without advocating it, and would prefer to accept the views of the Australasian surgeons, whose experience affords them the best opportunity to speak authoritatively.]

Carcinoma of the Breast.—Among the most important surgical papers of the year are those of Prof. Halsted on the results of operations for the cure of carcinoma of the breast.² In 50 cases operated upon by what he calls the complete method there have been only 3 local recurrences; 76 operations, complete and incomplete, have been performed in the Johns Hopkins Hospital for carcinoma of the breast; in one case death resulted. The disability produced by the operation was very slight. He advocates a very thorough and radical operation in which not only is the carcinomatous breast removed, but the parts adjacent to it are thoroughly extirpated. He often extirpates the cervical lymphatic glands. He removes the pectoralis major muscle entire, or all of it except its clavicular portion, in every case, because the operator is thereby enabled to remove in one piece the suspected tissue. We should remove suspected tissue in one piece first, lest the wound become infected by the division of tissues invaded by the disease or of lymphatic vessels containing carcinomatous cells, and because shreds or pieces of carcinomatous tissue might readily be overlooked in the piecemeal extirpation. The operation is performed as follows: 1. The skin-incision is carried at once and everywhere through the fat. 2. The triangular flap of skin, *A, B, C*, Plate 3, is reflected back to its base-line, *CA*; there is nothing but skin in this flap. The fat which lined it is dissected back to the lower edge of the pectoralis major muscle, where it is continuous with the fat of the axilla. 3. The costal insertions of the pectoralis major muscles are severed, and the splitting of the muscle, usually between its clavicular and costal portions, is begun and continued to a point about opposite the scalenus tubercle on the clavicle. 4. At this point the clavicular portion of the pectoralis major muscle and the skin overlying it are cut through close up to the clavicle. This cut exposes the apex of the axilla. 5. The loose tissue under the clavicular portion (the portion usually left behind) of the pectoralis major is carefully dissected from this muscle as the latter is drawn upward by a broad, sharp retractor. This tissue is rich in lymphatics, and is sometimes infiltrated with carcinoma—an important fact. 6. The splitting of the muscle is continued out to the humerus, and the part of the muscle to be

¹ Sem. Méd., 1894, No. 14, p. 21.

² Annals of Surgery, Nov., 1894; Johns Hopkins Hos. Rep., vol. iv.



Halssted's Operation for Removal of Breast.—Inckision.
(Johns Hopkins Hospital Reports, vol. IV.)

removed is now cut through close to its humeral attachment. 7. The whole mass, skin, breast, areolar tissue, and fat, circumscribed by the original skin-incision is raised up with some force to put the submuscular fascia on the stretch as it is stripped from the thorax close to the ribs and the pectoralis minor muscle. It is well to include the delicate sheath of the minor muscle when this is practicable. 8. The lower outer border of the minor muscle having been passed and clearly exposed, this muscle is divided at right angles to its fibers, and at a point a little below its middle. 9. The tissue, more or less rich in lymphatics, and often carcinomatous over the minor muscle near its coracoid insertion, is divided as far out as possible, and then reflected inward in order to liberate or prepare for the reflection upward of this part of the minor muscle. 10. The upper outer portion of the minor muscle is drawn upward (see Plate 4) with a broad, sharp retractor. This liberates the retractor, which until now has been holding back the clavicular portion of the pectoralis major muscle. 11. The small blood-vessels (chiefly veins) under the minor muscle, near its insertion, must be separated from the muscle with the greatest care. These are imbedded in loose connective tissue, which seems to be rich in lymphatics and contains more or less fat. This fat is often infiltrated with cancer. These blood-vessels should be dissected out very clean, and immediately ligated close to the axillary vein. The ligation of these very delicate vessels should not be postponed, for the clamps occluding them might of their own weight drop off or accidentally be pulled off, or the vessels themselves might be torn away by the clamps. Furthermore, the clamps, so many of them, if left on the veins, would be in the way of the operator. 12. Having exposed the subclavian vein at the highest possible subclavicular point, the contents of the axilla are dissected away with scrupulous care, also with the sharpest possible knife. The glands and fat should not be pulled out with the fingers, as advised, I am sorry to say, in modern text-books, and as practised very often by operators. The axillary vein should be stripped absolutely clean; not a particle of extraneous tissue should be included in the ligatures which are applied to the branches, sometimes very minute, of the axillary vessels. In liberating the vein from the tissues to be removed, it is best to push the vein away from the tissues rather than, holding the vein, to push the tissues away from it. It may not always be necessary to expose the artery, but I think that it is well to do this; for sometimes, not usually, the tissue above the large vessels is infiltrated, and we should not trust our eyes and fingers to decide this point. It is best to err on the safe side, and to remove in all cases the loose tissue above the vessels and about the axillary plexus of nerves. 13. Having cleaned the vessels, we may proceed more rapidly to strip the axillary contents from the inner walls of the axilla, the lateral wall of the thorax. We must grasp the mass to be removed firmly with the left hand, and pull it outward and slightly upward with sufficient force to put on the stretch the deli-

cate fascia which still binds it to the chest. This fascia is cut away close to the ribs and serratus magnus muscle. 14. When we have reached the junction of the posterior and lateral walls of the axilla, or a little sooner, an assistant takes hold of the triangular flap of skin and draws it outward to assist in spreading out the tissues which lie on the subscapularis, teres major, and latissimus dorsi muscles. The operator, having taken a different hold of the tumor, cleans from within outward the posterior wall of the axilla. Proceeding in this way, we make easy and bloodless a part of the operation which used to be troublesome and bloody. The subscapular vessels become nicely exposed and are caught before they are divided. The subscapular nerves may or may not be removed, at the discretion of the operator. Kuster lays great stress upon the importance of these nerves for the subsequent usefulness of the arm. We have not as yet decided this point to our entire satisfaction, but I think that they may often be spared to the patient with safety. 15. Having passed these nerves, the operator has only to turn the mass back in its normal position and to sever its connection with the body of the patient by a stroke of the knife from *b* to *c*, repeating the first cut through



Fig. 6.—Carcinoma of breast, showing part removed, in a case in which glands were involved, but not surely palpable before operation; one-half natural size. (Johns Hopkins Hosp. Rep., vol. iv.)

the skin. Figure 6 shows the part removed. [This radical procedure seems to us the best operation yet devised for these troublesome cases.]

The Cure of Carcinoma of the Breast by Radical Operation, with observations in 118 cases, is the title of a valuable article by Wm. T. Bull.¹ In these cases the diagnosis was confirmed by microscopic examination in every instance except one, and only three of the patients have been lost sight of. All of the cases cannot be recorded to furnish information as to the possibility of permanent cure, because all of the operations have not been complete. Ten incomplete operations were performed, the breast only being removed, and in every one recurrence followed. One hundred and eight complete operations were performed in which the breast was excised with a large amount of skin over it, the fascia of the pectoral muscle, and the glands of the axilla, with 4 fatal results, a mortality of 3.6 per cent. Bull accepts the third-year limit as evidence of cure of carcinoma, and deducts the 3 cases that

¹ Med. Rec., Aug. 25, 1894.

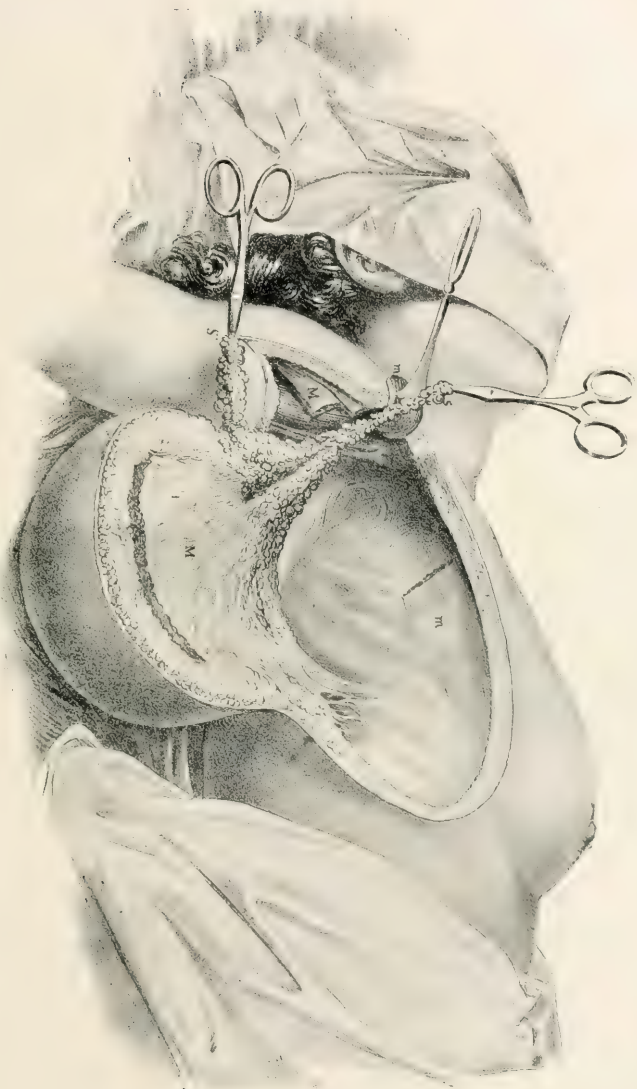


PLATE IV.

Hulstet's Operation for Removal of Breast—Extirpation.
(Johns Hopkins Hospital Reports, vol. iv.)

were operated upon subsequent to 1891, with the 3 cases lost sight of. This leaves 85 cases, 16 of whom were alive and free from recurrence on Jan. 1, 1894, and have lived an average of six years since the operation. This gives a recovery-percentage of 26.6 per cent. Of the patients in whom the breast alone was extirpated, all died of carcinoma at the termination of an average period of thirty-four and a half months. The author opposes incomplete operations, and believes that they are never curative and should only be employed for the relief of certain local symptoms. Complete operation should be performed in every case of carcinoma of the breast, whether the axillary glands are felt to be enlarged or not. Bull insists that the breast should be removed in one solid mass from the inner edge of the breast and the apex of the axilla, this method extirpating the skin, pectoral fascia, axillary glands, and lymphatics—the parts that are most likely to be the seat of recurrence. Bull's statistics show that the complete operation may bring about a cure even when the glands are involved, for of the 20 cases of cure the glands were involved in 8. Of the entire number, 85 cases, the breast and glands were both affected in 46, the breast alone in 22, and the condition not noted in 17. Bull believes that the hope of cure may be held out for at least half the cases if operation is performed before the axilla is invaded, for of the 22 cases in which the breast alone was affected, 12, or 54 per cent., were cured. Operation is indicated in the very earliest stages of the disease, and a positive diagnosis should be made in all cases of breast-tumor by means of exploration with a needle or by exploratory incision. Even if the operation fails to cure, it prolongs the individual's life, obviates suffering, retards the course of the disease, and makes life more bearable. Secondary operation may be demanded merely as a palliative; it should be done when the nodules are small and free from adhesions. There are no undesirable after-effects from a complete operation. [It is probable that axillary involvement takes place very early in breast-carcinoma. Herbert Snow thinks it begins in two months after the commencement of the disease. This fact indicates the necessity of thorough and early operation in every case in which we seek a cure.]

Willy Meyer¹ advocates the most radical operation for carcinoma of the breast. He believes that the pectoralis major muscle is frequently involved in the disease and is often the cause of recurrence, and he thinks it the duty of the surgeon to remove this muscle and also the axillary contents. It is also well to remove the pectoralis minor muscle. He cuts off the insertion at the humerus first, and then dissects from above downward. If the opposite method is followed, the arteries are likely to tear near the ribs, and they are very difficult to secure. The ordinary manipulations employed in removing the breast have been thought by some to cause the entrance of carcinomatous matter into healthy tissues, thus producing secondary metastatic growths. It has been proposed, therefore, by Gerster to clear out

¹ Am. Medico-Surg. Bull., Dec. 1, 1894.

the axillary contents first, a procedure advised years ago by the younger Gross. This is an important suggestion, but there are other lymphatics that should be considered. Meyer believes that the tearing off of a carcinomatous breast from the subjacent muscles does often cause the introduction of carcinomatous matter into the system. His plan of operation is as follows: He makes the usual incision, cutting wide of the disease and running up a little further than is usual into the axilla to facilitate the removal of the pectoralis major muscle. A second outer incision is made from the axillary incision up to the clavicle, at the junction of its middle and outer thirds, so as to still further expose the pectoralis major muscle, which is divided near its tendinous insertion and at its clavicular insertion, and then the axillary fat with the glands is dissected out. The muscles are finally amputated at their thoracic attachment. [The space of Mohnheim should always be explored for glands in any operation. This method affords ready access to it.]

Dispersible Tumors of the Mamma.—Snow¹ in his discussion of this subject states that there are a considerable number of cases in which nonmalignant tumors of the breast may be dispersed, and in which resort to operation is to be deprecated. The foremost example of this is the fibroma of adolescence, the familiar adenoid of young girls between the ages of fourteen and twenty-five. The cystic fibroma that occurs after the age of thirty-four presents different phenomena from the adenoid of young girls. It grows slowly to a large size, blends with cysts, is incapable of evolution, and is sooner or later invariably merged into malignant disease; whereas the fibroma of the developing breast is small, often multiple, shows no tendency to cyst-formation, never passes into carcinoma, and can readily be dispersed. The subjects of the fibroma of adolescence wear tight stays, are neurotic, have uterine disorder and marked anemia. Frequently both breasts are attacked simultaneously or successively, and when one breast has been operated upon it is no uncommon thing to find nodules subsequently develop in the other. As a matter of fact, these cases almost never demand surgical operation. The indicated treatment is inunction of an ointment of the lead iodid with belladonna and lanolin, treatment of the neurotic state, and removal of pressure from the breasts and pelvic organs. Snow's favorite ointment consists of powdered lead iodid, lanolin, and lard, which is to be well rubbed in four times a day. A dose of 15 grs. of potassium bromid is given internally each night at bedtime. Other classes of tumors are mentioned that may sometimes be dispersed, and they are constituted by local indurations of the parenchyma, found after the full development of the mammary gland. They are probably inflammatory in origin, or arise by cystic distention of, or inflammatory effusion about, the milk-ducts. They may be composed of small cysts of the areola, usually sebaceous. The youthful male breast is sometimes the seat of hyperplasia, and may yield to like treatment.

¹ Brit. Med. Jour., Nov. 3, 1894.

The Treatment of Inoperable Malignant Tumors with the Toxins of Erysipelas and *Bacillus Prodigiosus* has been discussed by Coley.¹ Whether toxins should be tried in all inoperable cases requires the consideration of many factors. If administered by men of experience there is but very little risk in their use, and much may often be accomplished in apparently hopeless cases; such cases should therefore have the benefit of a trial. If improvement is likely to occur, some evidence will present itself within two weeks after beginning the injections. He admits that the agent is as yet not thoroughly understood, and advises that it be used with the greatest caution, for individuals vary in their susceptibility, and the minimum dose should be first used. In one of these cases he thinks the end was hastened by the injection. He refers to another field of possible usefulness for the toxins—that is, after primary operation for sarcoma, before recurrence has been allowed time to take place; the reasons for using this treatment are theoretically strong; since at least 75 per cent. of cases do recur after primary operation, the importance of this field is apparent. He describes the method of preparing the toxins at considerable length. Summarizing his cases, he says that up to May, 1894, he treated 25 cases of inoperable sarcoma with mixed toxins; 8 of inoperable carcinoma, and 3 of sarcoma or carcinoma. In carcinoma he had improvement in a number of cases, but no cure. In sarcoma there were 6 cases in which he thought there was a reasonable hope of permanent cure having been attained. Of 2 other cases, 1 has gone on to entire disappearance of a very large tumor and promises to be a cure, and the other, a six-time recurrent sarcoma of the hand, is in perfect health at present, nearly two years since the beginning of the treatment. Since May 31, 1894, he has treated 24 cases of malignant tumors, all inoperable and mostly recurrent, with the mixed toxins: 13 of these cases were sarcoma and 11 were carcinoma. In no case of carcinoma did the tumor entirely disappear, although the injections had a positive retarding influence, and in some of the cases it produced extraordinary improvement. In a number of the sarcoma-cases the disease was so far advanced that there could be no hope of recovery, but the powerful controlling influence of the toxins was demonstrated, and had the patient's general condition permitted prolonged use of the treatment the result might have been otherwise. In 3 of the sarcoma-cases the tumor entirely disappeared, and it is improbable that relapse will occur. Out of a total of 38 cases of inoperable sarcoma 9 cases promised to be permanently cured. He arrives at the following conclusions: 1. The curative action of erysipelas upon malignant tumors is an established fact. 2. This action is much more powerful in sarcoma than in carcinoma. 3. It is chiefly due to the action of the erysipelas streptococcus, which may be isolated and used with safety. 4. This action is greatly increased by the

¹ Am. Jour. Med. Sci., and Med. Rec., Jan. 19, 1895.

addition of the toxins of the bacillus prodigiosus. 5. The toxins, to be of value, should come from virulent cultures and should be freshly prepared. 6. The results obtained from the use of toxins without danger are so nearly equal to those obtained from an attack of erysipelas that inoculation should rarely be resorted to. The dose of his strong preparation varies from 1 to 8 minims. He has had a temperature of 105° F. follow the injection of 2 minims. He usually begins with a minimum dose and gradually increases until the desired reaction is produced—that is, a temperature of from 103° to 104° F.

Beck¹ also discusses the treatment of malignant tumors with the toxins of erysipelas, and reports a series of cases. His conclusions are: 1. That accidental erysipelas, like many other infectious diseases, has an influence on preexisting pathologic processes. 2. This influence is not constant, and does not limit itself to a certain group of pathologic conditions; the cultures of erysipelas seem to influence pathologic processes more than the toxins, and accidental erysipelas more than the cultures. 3. It is at present impossible to say anything definite about the therapy of the cultures and toxins. The same effects are obtained by the use of arsenic, potassium iodid, injections of alcohol, zinc chlorid, and many other substances. 4. In many cases, when a sarcoma has been pronounced cured, it seems probable that a mistake in diagnosis was made, inasmuch as it is very difficult in certain cases for even the well-educated eye of the microscopist to make a definite differential diagnosis between syphilitic granulations and sarcoma. 5. Dr. Beck inclines to the belief that the process that takes place in sarcomata injected with toxins is a fatty degeneration that sometimes proceeds to necrosis. 6. There is danger in the use of the toxins so long as certain and objective indications are not pronounced, because tumors that are operable and give a good prognosis might be experimented upon, and operation delayed until too late.

The Value of Inoculations with Septic or Toxic Agents in the Treatment of Malignant Neoplasms.—Wyeth² concludes that sarcoma may be cured by septic infection, the sepsis of erysipelas exercising the most powerful curative influence; infection from the streptococcus pyogenes aureus will also cure sarcoma. The injection of the sterile products of Fehleisen's coccus will also cause these neoplasms to disappear. These agents act through the blood. It is probably better to inoculate in the mass, and get the local action of the inflammatory process when this is possible. The lower the order of the structure of the sarcoma, the less the likelihood of a successful result, and thus in tumors of a myxomatous character the prognosis is less favorable. Epitheliomata may be made to disappear, or their growth may be retarded, by septic infection. Adenoid carcinomata are only slightly, if at all, susceptible to cure or retardation by these agents.

¹ Chicago Med. Recorder, Aug., 1894.

² Jour. Am. Med. Assoc., June 30, 1894.

Richet and Hericourt¹ describe two cases of malignant growths in which they applied the serum-treatment. The serum was obtained from the blood of an ass and two dogs, into which the authors had injected the liquid expressed from an osteosarcoma of the leg removed by Reclus. The first case was a fibrosarcoma the size of an orange. It was removed in October, 1894, by Terrier, and reappeared in February, 1895. In the middle of March, when the injections were commenced, it had attained the size of a small orange. The injections were made into the cellular tissue around the tumor, 3 cm. for each injection daily, and were continued for forty days, representing a total dose of 120 c.c. The tumor was reduced to a small indurated area, and the general condition of the patient was improved. The second case was one of a carcinoma of the stomach. The treatment was commenced on the 6th of April, and amelioration of the condition immediately began. The patient gained in weight; the tumor diminished in volume, and finally could no longer be felt. [To use serum containing sarcoma-products for the cure of *carcinoma* of the stomach seems unphilosophical in the extreme.]

The Treatment of Splenic Fever by Erysipelas-serum.—Emmerich² calls attention anew to various facts previously demonstrated in regard to the cure of splenic fever by erysipelas-serum, and makes suggestions as to the treatment of carcinoma and other malignant inflammations by the same agent. Emmerich has cured malignant pustule in rabbits by injecting erysipelas-serum from which the cocci had been separated by filtration. The cure was more rapid if the serum was obtained from other animals than the rabbit, the sheep being one of the best. The author states that a proteid substance results from the death of the streptococci in the blood, and combination of this substance occurs with the albuminoid part of the blood. He advocates a trial in malignant growths of the erysipelas-serum obtained especially from the sheep.

The treatment of carcinoma with erysipelas-serum is presented by Emmerich and Scholl,³ who set forth their clinical experience and refer to Coley's investigations in regard to the effect upon malignant growths of bouillon-cultures of erysipelas cocci with bacillus prodigiosus. The serum used by Emmerich and Scholl is obtained by inoculating a sheep with a culture of erysipelas and filtering the serum to remove cocci. The filtered serum is used to inoculate the victims of inoperable malignant disease. Only two cases failed to show results, and in each of these cases there was secondary infection and suppuration of the carcinoma. They present the records of 6 hopeless cases, 4 of which were recurrent mammary carcinomata, 1 a fast-growing and inoperable mammary carcinoma, and 1 an old case of canceroid. The first case presented a mass of recurrent carcinoma, extensive infiltration of the infrascapular space, and glandular enlargements in the axilla. The mass and the

¹ Presse Méd., May 4, 1895.

² Centrallbl. f. Chir., No. 45, 1894.

³ Deutsche med. Woch., April 25, 1895.

enlarged glands disappeared under serum-therapy, and the condition improved so greatly that the patient became able to move her arm. In the second case the hard mass disappeared, but the treatment was suspended for imperative reasons. In the third case ulceration with metastasis existed. Several of the masses diminished in size, and the general condition notably improved. In the fourth case a metastatic deposit in the arm disappeared. In the fifth case the carcinoma diminished in size. The great mass in the axilla diminished one-half in size in two weeks. In the sixth case a long-standing cancrroid of the face diminished greatly in size. The authors hold that the action of the serum is specific, and they believe it will prove more useful in sarcoma than in carcinoma. The amount injected is gauged by the size of the growth and the condition of the patient. In small tumors from 1 to 4 c.c. should be injected into the growth each day, but in large tumors from 10 to 25 c.c. can be injected. Injections are not productive of much pain, and rarely cause fever. The improvement brought about in the general condition is remarkable. A pseudoerysipelas occasionally develops and lasts from two to four days. The use of the serum is not restricted to inoperable cases, but even in ordinary cases it should be used to aid the effect of operation and to antagonize recurrence.

Some time since, Selva¹ made a study of the curative influence of erysipelas upon granulating surfaces and sarcomatous growths, and insisted that its infectious nature and its dangers should be borne in mind; accidental erysipelas he found to have a curative effect upon granulating surfaces, but he maintained that its use in the treatment of ulcers is unjustifiable. He protested against the indiscriminate employment of cultures of the streptococcus in the treatment of neoplasms by Coley's method. He showed that there is a marked discrepancy between the clinical and pathologic evidences in Dr. Coley's cases of disappearance of neoplasms under his treatment contrasted with the results obtained by Dr. Councilman. He concludes that the problem is by no means solved, and further investigations are necessary as to the real effect of erysipelas-toxins on malignant growths. This accords with our experience. Reported results have been remarkable, and some great successes seem to have been obtained. Our own individual experience has been limited, but from that alone we could not extract a "robust faith" (Senn's expression) in the method.

The Etiology and Pathogenesis of Carcinoma.—In the discussion at the French Congress of Surgery on this subject Guelliot² stated that his belief in the carcinomatous diathesis prevented the acceptance of the doctrine of the infectious nature of carcinoma, which is primarily a local disease and only secondarily constitutional. He said that the experiments of Hanau and Moreau proved that carcinoma can be inoculated on animals of the same species, and as this can be done experimentally the spontaneous heteroinoculation must be regarded as possible and remains to be proved clinically. He

¹ N. Y. Med. Jour., vol. xix., No. 26.

² Am. Jour. Med. Sci., June, 1895.

tells us that the rational proofs of the exterior origin of carcinoma and of its transmissibility are drawn from the usual seat of tumor, from the influence of lesions, irritation or ulceration, and from the records of unquestioned cases of accidental inoculation. The unequal distribution of the neoplasm has long been recognized, and can be explained only by the action of exterior causes. There is no question of doubt that there are veritable centers or abodes of carcinoma. He has collected 15 examples, embracing 50 patients, in which the inference of contagiousness was very strong. He tells us that instructive cases are those of epithelioma occurring successively in persons who dwell together. He has reported 42 of his own cases of this description, which, when added to those already published, give 113 observations. The interval separating the appearance of the disease in the two persons was not beyond two years in more than half the cases. He says that these observations force us to a belief in the transmission of the disease either directly or indirectly, and that it spreads as an infectious disease. The incubation-period is from several months to two years, and the disease is first localized and then general. This fact is of very great importance, as it indicates the imperative necessity of prophylactic measures. In the debate Mayet said that laboratory-experiments led him to believe that carcinoma is an inoculable disease not only by grafting, but by injection of the juice. The white rat is the most favorable animal on which to make these studies. He has several times inoculated it with carcinoma-juice obtained by the method of Brown-Séquard in making animal extracts, with positive results in one case out of three, the autopsy showing carcinomatous deposits in the kidneys. Two cases are reported by Dr. Sippel¹ that bear upon this discussion. The first case was a carcinoma of the vagina that had developed upon the exact point where the vaginal wall was in contact with a preexisting carcinomatous ulcer of the portio. The other case, carcinomatosis of the peritoneum, developed subsequently to an ovariectomy; small nodules occurred in almost all of the suture-wounds of the abdominal incision, while the incision itself remained unaffected. Geissler² discusses the communicability of carcinoma, and critically considers previous experiments and reports his own efforts. He used fresh aseptic carcinoma-sections, which he introduced beneath the dura of rabbits. Twenty-five rabbits were used. The sections were chiefly from nonulcerated mammary carcinoma, but were also from carcinoma of the upper lip, and, for comparison, from a large ulcerated sarcoma of the elbow, pieces from the pectoral muscle that had been removed in extirpation of the breast, and gland-tissue that microscopic examination indicated was unaltered. Animals that had been inoculated one or two months previously with fresh carcinoma-tissue remained in perfect health. Whenever he excluded septic matter the aseptic carcinoma-tissue healed in the brain as certainly and with as little reaction as did adipose tissue, muscle, and gland. Careful necropsies never

¹ *Centralbl. f. Gynäk.*, No. 4, 1894.

² *Schmidt's Jahrb.*, 1894, No. 3, p. 232.

showed an enlargement of the implanted fragments; indeed, in the brain they manifested a tendency to be transformed into connective tissue. In not one instance were metastases or lymphatic infiltrations observed. In line with these experiments are those of Gratia, reported at the Academy of Medicine in Brussels. His experiments led him to believe that carcinoma is not inoculable even between individuals of the same species. He concludes that the parasitic nature of the disease has not been demonstrated, and that the direct or indirect contagiousness has not been proved, although he admits the possibility of grafting it in individuals exhibiting exceptional predisposition. The etiology and pathogenesis of the affection are still undetermined.

Duplay and Cazin¹ discuss the transmissibility of carcinoma, and decide that it is improbable that malignant growths are transmissible, either by graft or inoculation, from animals of one species to those of another. In one experiment made on a rat there was obtained, by placing a subcutaneous graft in the region of the mamma, an enormous growth in all respects similar to that which had occurred in the rat from which the graft was taken. The authors conclude that transmissibility may be possible, but that it does not take place excepting under conditions practically never realized. On the other side of the question, Haviland² discusses the subject of "cancer-houses," and points out that a study of the Registrar General's returns demonstrates the existence of carcinoma-fields and areas in England, that soil and situation have much to do with the mortality from that disease, and that there are carcinoma-houses and cancerous water-supplies. He fails to see why scirrhus, rodent ulcer, epithelioma, or any other form of carcinoma may not proceed from one and the same cause. He cites a series of cases of great interest and importance, and comments upon Feissinger's report as to the occurrence of an epidemic of carcinoma in a group of three houses at Oyomax, where four cases came under his observation in the space of four years. In all the cases the affection could apparently be traced to the dressings from a case of scirrhus of the breast. Haviland thinks that if such cases were thoroughly sought for and recorded much light would be shed on the etiology of the disease and also on the causes that promote its increase and extension, the knowledge of which would lead to the enforcement of greater caution in the treatment.

Carcinoma in its etiologic and histologic relations was discussed during the session of the Eleventh International Medical Congress at Rome.³ Foa called attention to the remarkable frequency with which carcinoma occurred in certain localities, and said that the mortality in such places occasionally amounted to 15 per cent. of the whole mortality, whilst in other places it fell as low as 7 per cent. He said that the cases of actual contagion were few, yet some undoubtedly existed; that grafting had been done successfully, for, although it was impossible to graft the carcinoma of a man on the lower

¹ *Mercur. Méd.*, 1894, No. 15.

² *Lancet*, April 27, 1894.

³ *Med. News*, 1894, p. 437.

animals, the carcinoma of animals could be inoculated in another animal of the same species. The question of the existence of protozoa in carcinoma was, in his opinion, an extremely complicated one, as different observers had described various objects as parasites that had nothing in common with each other. The parasites described by Darier, Wickham, and others were simply cells or products of degeneration. On the other hand, he believed that the structures described by himself and Plimmer had the characteristics of parasites. He believed that the larger and more cystic forms occurred in the center of the carcinomatous tumor, and the smaller ones at the periphery. He said that certain well-defined bodies, which are easily recognized, that stain characteristically, and that can be certainly distinguished from cellular infections and degenerations, undoubtedly do exist in carcinoma. In the subsequent debate Trasbot called attention to the frequency of carcinoma in dogs and horses and its rarity in cattle, and said the so-called successful inoculation of carcinoma in dogs must be regarded with great skepticism. He had made many inoculations, but had only once obtained positive results, and in that case the tumor grew for a few months only and was then absorbed without any metastases in internal organs. Cornil said that there are many clinical facts proving that carcinoma can be propagated by autoinoculation—for instance, from one side of the labia majora to the other, or from the lower lip to the upper. He referred to cases of exploratory puncture in which the neoplasm developed in the needle-track, and said that there is evidence in certain cases that carcinoma can be communicated from one individual to another. Cazin had performed inoculation-experiments in animals of the same species that had proved unsuccessful, except in three cases of nonmalignant tumor. All cases in which he had grafted epithelial tumors from animal to animal were uniformly unsuccessful, although graftings from one dog to another part of the same animal had always been attended with success. Schroen said that in order to obtain positive results in inoculations of carcinoma in animals it is necessary to inoculate the metastases and not the primary tumor, for grafting of sarcoma only succeeded when one inoculated metastatic tumors.

The Treatment of Carcinoma.—Snow¹ discusses at considerable length the insidious invasion of the bone-marrow by mammary carcinoma, which was his own discovery. This is a routine occurrence. He asserts that the natural deposit of carcinoma-cells takes place within the marrow, and, further, that the morbid state underlying various bone-conditions, such as fragilitas ossium, is due to actual invasion of the tissues, and that it takes place in the great majority of breast-cases, if not, indeed, eventually in all. It is insidious, and it does not produce tumor, fracture, or marked deformity, though it is plainly recognizable by the physician trained in the symptoms. The most striking sign is the slowly-advancing prominence of the sternum at the upper middle portions of that bone (the sternal symptom).

¹ London Practitioner, Aug., 1894.

This is associated with pains in the lungs and scapula, gnawing and deep-seated, and not referred to the articulations. There may be tenderness on pressure, and some thickening of the humerus on the side of the disease in its upper third. The carcinoma-cells gain access to the bone-marrow through the lymphatic system. As a rule, deposit in the axillary lymph-glands takes place in about two months from the beginning of the subsequent growth. As a result of this deposit the lymph-channel is blocked and the lymph-stream is diverted in abnormal directions. Regurgitation takes place in the lymphatics, passing from the medulla of the humerus, which is the bone usually first attacked, and thus the cells are deposited in the marrow of this bone. They reach by the same means the remains of the thymus gland, and, multiplying in that structure, produce infiltration of the sternum and the peculiar sternal deformity, which, after attaining a certain degree, remains stationary, rarely reaching the level of tumor-formation. The transference in these two directions may be interfered with when the lymphatics are cut, as in the operation, or by atrophic conditions that permit of life from ten to thirty years, but in all ordinary cases not excised within two or three months these phenomena occur sooner or later, and are followed by the passage of cells into the general circulation with visceral metastases. The average period at which marrow-symptoms appear after the surgical removal of the mammary gland is four or five years. This explains many of the mysteries that have ordinarily attended a study of carcinoma of the breast, especially the tendency to recur after excision, the deposit long afterward in the opposite breast, and the production of obscure bone-lesions. He tells us that in 150 cases of mammary carcinoma seen at an average period of about ten months from inception, 90 showed well-marked symptoms of involvement of the marrow at the first interview, 20 showed symptoms more slightly marked, and 8 developed them subsequently, leaving 30 in which the phenomena were absent or unrecognizable. These latter cases were either too recent to betray symptoms or were atrophic cases of many years' duration. We may thus assert that marrow-infection is present in 8 out of 10 cases, or 80 per cent.

Mr. Snow insists upon the very great value of opium in the treatment. He tells us that it is a barbarous practice to withhold the agent until pain compels its use. This drug should be resorted to in the very earliest stages whenever it is evident that a curative surgical extirpation is out of the question. He says that if opium is given continuously in the early stages, ulceration will be long delayed, often entirely prevented, and the cancer will frequently pass into a shriveled and atrophic condition, compatible with many years of comfortable life. Opium and morphin exert a powerful inhibitory action upon the growth of carcinoma-parenchyma, materially checking cell-proliferation. He says that the neoplasm kills not so much by its growth on the primary site as by infection-metastases from this area, and

hence it follows that a permanent cure can always be effected in the organs with which the surgeon is mainly concerned, provided that not only the part first diseased, but also the tissues ordinarily infected secondarily, be thoroughly removed before the infection has extended farther. The excision of the scirrhus breast only is practically futile, possibly prolonging life a little and modifying suffering, but that is all. In order to effect a cure the axillary lymph-glands, which are infected as a rule *within eight weeks* of the beginning of the disease, must be thoroughly cleared away. Then, provided that the operation takes place within the above period, we may well hope for lasting immunity. He says the golden maxim of modern carcinoma-surgery is, "Excise the dangerous lymph-glands in the definite infection-path before the relatively late stage of their enlargement," for it is to be remembered that noticeable increase in glandular bulk does not take place until after weeks of insidious cell-growth in the meshes of lymphatic glands, during which period distant glands are receiving metastases, and cell-particles may pass into the current of the circulation.

J. Carne Ross¹ calls attention to the value of cinnamon given internally in large doses in the treatment of carcinoma, and claims that this drug is not only valuable in subduing pain, but that it tends to improve the general health of the patient. He cites a series of cases to prove his point, claiming marked improvement in the general health and notable abatement in the pain. He says the best results have been obtained in cases in which the tumor was not exposed to the air.

Attention is directed² to the suggestion of Mr. Jonathan Hutchinson that the evolution of epithelioma may be facilitated by a long course of arsenic. In his paper on this subject Hutchinson described a number of cases in which there seems to be evidence that arsenic did favor the evolution of carcinoma. At a recent meeting of the Clinical Society, discussing a case of multiple epithelioma appearing after a course of arsenic, he called attention to certain changes in the skin of the palms and soles (furfuraceous thickening of the skin), which should be warnings to the physician to desist from further administration of the drug.

Darier³ reports the success of Mosetig of Vienna in the treatment of carcinoma with methyl-blue. He describes a series of carcinomata of the face, which he says were cured by the daily application of a 20 per cent. solution of the drug. He says a sore should be touched every day, but the good result will be more quickly produced by cauterizing the carcinoma with chromic acid or the galvanocautery. For deep-seated carcinoma he recommends that the solution be hypodermically injected. A tumor the surface of which is broken should be covered by a healthy skin-flap on or about the fifteenth or twentieth day after treatment commenced.

¹ Med. Press and Circ., Oct. 24, 1894.

² Ibid., Feb. 31, 1894.

³ In a communication to the Acad. of Med. of Paris, Dublin Jour. Med., Jan. 1, 1895.

The Spontaneous Cure of Abdominal Tumors is the title of a paper by Greig Smith.¹ He made observations on solid tumors of myxomatous, tuberculous, and inflammatory nature, that had been found to disappear after an operation had been attempted but abandoned because of the unfavorable characters of the growths. He believes that the tumors that spontaneously disappear originated in the process of phagocytosis and the heaping up of embryonic protective cells around a minute fistulous opening in the intestine. The cure of such a growth is accidental and not spontaneous; in one case it depended upon diversion of the intestinal contents, and in two cases on an external opening of the intestinal fistula. [Powers has suggested that these cases may be due to inflammatory changes in connection with Meckel's diverticulum.]

Removal of the Tongue.—Butlin² discusses a series of 46 cases of removal of half or the whole of the tongue by Whitehead's method. The lingual artery was tied in those cases in which the disease affected the base of the tongue, and in those cases in which the situation of the diseased glands was such that the same incision was suitable for ligature of the artery. He advises that such wounds be drained for a week or ten days. The directions for after-treatment are: Maintain the wound in as aseptic a condition as possible, diminish the flow of the discharges into the air-tubes, and prevent food from passing into the trachea. He considers that the best means to maintain the wound to some extent aseptic is the use of powdered iodoform in the mouth, and the use of a mouth-wash of Condy's fluid or weak phenol-solution. In order to lessen the flow of discharges down the air-vessels he orders that the patient's head be kept low and that he lie on one side. When one-half the tongue has been removed liquids can easily be swallowed on the day after the operation, if administered from a feeder with a spout, a piece of india-rubber tubing being fixed to the spout. If the right half of the tongue has been removed, the patient lies on the left side during feeding, and vice versa if the left half has been removed. When the whole tongue has been removed difficulty in swallowing is much greater, and a number of days may pass before the patient learns how to swallow liquids and solids, a certain portion invariably tending to pass into the air-tubes. Hence, after complete removal of the tongue, during the first forty-eight hours the patient must be fed by the rectum, then a swallow of water should be tried; but if the patient has any difficulty, he must be fed through a tube, No. 9 or 10 of the English scale. Out of 46 cases there was only 1 death, and 19 of the patients were over sixty years of age.

¹ Read before the Royal Medical and Chirurgical Society, *Lancet*, p. 207, vol. i., 1894.

² *Brit. Med. Jour.*, April 14, 1894.

DISEASES OF THE ABDOMEN AND GASTROINTESTINAL TRACT.

Appendicitis.—As is to be expected, the year has produced a vast mass of literature upon appendicitis, and the difficulty is to cull out the representative articles.

The subject of calculi of the appendix is presented by Rochaz,¹ and his conclusions are : 1. Appendicitis is caused, in the great majority of cases, by stercoral calculi, even though they be not found at the operation. 2. Foreign bodies proper are very rare in appendicitis. 3. Worms are not found in the appendix during life. 4. In the normal appendix the fecal matter is found most frequently in a fluid state. 5. The calculi form in the appendix itself. 6. Usually they are not multiple. 7. Their general form is elongated, their color is generally brownish, their consistence is as frequently hard as soft. 8. On section they commonly present a disposition to concentric layers. 9. The nucleus is, as a rule, of lighter color than the envelope ; it is very rarely a foreign body. 10. The chemical composition of appendix-calculi closely corresponds to that of human feces. 11. Men are more subject to appendicitis by foreign bodies than women.

Morris² advocates operation by an inch-and-a-half incision, and claims that the small incision lessens the danger of hernia and avoids the production of an unsightly scar. He maintains that the inch-and-a-half incision is sufficiently long for manipulation, it matters not how extensive the adhesions may be. In the attempt to confirm his view Morris presents the records of 39 nonsuppurative cases operated upon through the small incision, chiefly interval-cases, and all of which were successful. [Morris makes the surprising claim that the shorter the incision the less the time required of the patient to remain in bed ; that is, he would maintain that the healing of a short incision is more rapid than the healing of a long incision. Morris is to be congratulated upon the success of his results, but nevertheless we consider it bad surgery to lay down any hard-and-fast rule for the size of an incision. A surgeon might as well lay down in inches the size of opening necessary to remove the clot and ligature a ruptured meningeal artery. To recommend an inch-and-a-half incision with a week-and-a-half confinement is to sacrifice common sense to epigram. The length of incision must be determined by the case. In breaking up adhesions the eyesight should come to the aid of the touch ; and in many cases so important is the eyesight that we seek to aid it by the use of an electric forehead-light. It is ridiculous to claim that an inch-and-a-half incision will heal more rapidly than a two-inch or a three-inch incision, for if modern methods be founded on truths, the time of healing does not depend upon the size of the wound. Surgeons constantly see amputation-stumps healed in from six to eight days. In the debate upon Morris's

¹ *Revue Méd. de la Suisse Romande*, No. 14, 1894.

² *Am. Med. and Surg. Bull.*, Jan. 1, 1895.

paper McBurney spoke, and his sentiments, which follow, we most cordially approve: "I presume that all surgeons would agree that no longer incision should be made than is necessary to allow one to operate safely and well. I cannot see, however, any more reason for insisting upon a one-and-a-half inch incision when operating upon a case of appendicitis than when operating for the removal of an ovarian or a mammary tumor. Such tumors can easily be removed through an inch-and-a-half incision if the tumor is sufficiently small and no dissection is required. I must, therefore, object very decidedly to the statement that measuring the length of the incision in an operation for appendicitis adds in any way to the value of the procedure. I must differ, also, regarding the statement that the length of time the patient must remain quiet in bed bears a definite relation to the length of the incision. This is entirely at variance with all well-recognized principles of surgery. A good surgeon can procure primary union in an incision six inches long in exactly the same length of time that is required when the incision is only one inch long. I think, therefore, we shall mislead practitioners if we endorse the theory that there is any special virtue in an incision of any specified length, and encourage the idea that the same incision is suitable for all patients, whether large or small, fat or thin, regardless of the amount of dissection required to safely free the appendix from inflammatory attachments. It seems to me unsurgical and unwise to endeavor to establish a 'standard incision' to be made use of in operations upon the vermiform appendix. I find, moreover, that when Dr. Morris meets with any especially difficult case he also increases the length of the incision, thus adhering to the principles we all recognize. The length of time the patient should remain in bed after an abdominal operation is largely a matter of opinion, but I certainly object to the general statement that any person operated upon with a one-and-a-half-inch incision may get up several days sooner than one in whom the incision has been a trifle longer. The Surgical Section of the Academy should be careful how it endorses doctrines not based upon sound surgical principles." Wyeth and Stimson agreed with McBurney, and each of these distinguished surgeons asserted that he would not allow any operator to remove his appendix through an inch-and-a-half incision.]

Halsted¹ says there can be no definite incision. In large abscesses the incision is to be made near the crest of the ilium, as such an incision lessens the chance of hernia, because the muscles in this situation are thick and can be accurately approximated. Furthermore, frequent operations upon psoas-abscesses have taught us that hernia rarely occurs in this region, even after extensive incision. The iliac incision avoids opening the peritoneal cavity. An abscess-cavity is not to be disinfected. Thorough disinfection of any abscess is possible only by excision of its walls. The walls of an appendicular abscess cannot be excised, and irrigation is not only practically value-

¹ Johns Hopkins Hospital Bulletin, June and July, 1894.

less, but is dangerous, as it may rupture the barrier that separates the pus from the peritoneal cavity. The writer tells us not to search for the appendix in large abscesses if search will entail the danger of rupture of the septum.

Halsted recommends drainage, not only when pus is found outside of the appendix, but also when it is discovered inside of this diverticulum, and he advises drainage by means of strips of iodoform-gauze. He says, if indications do not point to the existence of pus, make the incision directly over the appendix, which structure can usually be palpated; in infected cases never sew up the end of the stump; to do so merely wastes time, for the circulation of the stump has been cut off by the ligature of its base.

Perforative Peritonitis is discussed by Barbacci,¹ who maintains that the exudate in perforative peritonitis contains various microorganisms, the bacterium coli commune being constantly present, and when patients die of perforative peritonitis, the bacterium coli commune is found in the blood of the heart. The diplococcus lanceolatus capsulatus of Fraenkel is often absent, but when it is present it may cause pneumonia, pleuritis, or endocarditis. The diplococcus of Fraenkel does not explain the great fatality of the condition, because the organism is often absent, nor does the bacterium coli commune explain it. It is, indeed, always present, but peritonitis cannot be experimentally produced by introducing this organism into the peritoneal cavity unless some irritative material is introduced with it to prepare the soil for its lodgement and growth. The author maintains that these irritants are found in intestinal gases and feces, and that they prepare the soil for the bacterium coli commune, and that other extruded organisms cannot develop even in this soil, and will quickly perish.

Appendicitis Obliterans.—Senn² presents a study of a not unusual form of relapsing appendicitis, which he designates appendicitis obliterans, because the process is progressive and eventually leads to destruction of the epithelial lining and of all the glandular tissue and to complete obliteration of the lumen of the appendix. This disease begins either as a superficial ulcer of the mucous membrane or as an interstitial process following lymphatic infection, granular tissue being produced from the submucous tissue, which, after conversion into connective tissue, undergoes contraction. The usual symptoms are relapsing acute attacks of short duration, in which, while there is moderate or no recognizable swelling at the seat of disease, there are persistent soreness and tenderness in the region of the appendix, even during the intermissions. The obliterative process may begin at either the distal or the proximal end, or at any place between, or it may commence simultaneously or successively at different spots. Obliteration of the proximal side causes retention of septic material, which obtains an irregular outlet through the lymphatics, causing nonsuppurative lymphadenitis and lymphangitis. Circumscribed plastic peritonitis is an almost invariable attendant

¹ Schmidt's Jahrb., No. 3, 1894.

² Jour. Am. Med. Assoc., March 24, 1894.

of this form of appendicitis, and hastens obliteration. Complete obliteration results in a permanent cure. In view, however, of the sufferings incident to waiting for the spontaneous cure to occur by obliteration, and in view of the possible dangers attending prolonged waiting, operation is indicated, and should be performed as soon as a positive diagnosis is obtained.

Recurrent Appendicitis.—Robson¹ reports eight cases of recurrent appendicitis, and says that in such cases there are three courses that may be pursued: 1. Nonoperative, trusting to rest and diet, with opium, in order to bring about resolution, and in the hope that this attack may prove to be the last. 2. Operation on the second or third day, as advised by most American surgeons, who discourage the removal of the appendix between the attacks because of the chance that there may be no recurrence. 3. Operation in the period between the attacks, because the patient is likely to be in the best condition, also because there is less likelihood that there will be an extensive collection of inflammatory products, and, finally, because an operation in the quiescent period rarely requires drainage, and the appendix can be dealt with in the most satisfactory manner. Robson looks upon the appendix as a thick tube of adenoid tissue, and agrees with Bland Sutton that it is similar to the tonsil in structure; this tube, being continuous with the colon, always contains feces, and the epithelium alone guards the adenoid tissue from infection. Any swelling of the adenoid tissue readily blocks the tube. The muscles readily become subject to painful spasm, and the thin peritoneal covering is liable to permit infection of the peritoneal cavity. Any local cause that will displace the protecting epithelium permits the passage of bacteria into the adenoid tissue, in which situation they rapidly originate an infective inflammation known as appendicitis in either an acute, a subacute, or a chronic form.

[We would take issue with Robson in his statement that American surgeons as a class oppose operating between attacks, as some of the most distinguished surgeons in the country strongly advocate it as not only justifiable but necessary, considering that every fresh attack is almost certain to be followed by others, and that any one of these subsequent attacks may be fatal and will at least render less probable the patient's entire recovery. How an old recurrent case may after a long time become dangerous is shown by the record of a patient of Prof. Da Costa.² He had had forty-seven previous attacks, and was operated upon in the forty-eighth attack, when an abscess was discovered just on the verge of rupture.]

Wyeth³ maintains that appendicitis is strictly a surgical lesion; that the danger to life that makes it a surgical lesion is from peritonitis; and that peritonitis may occur with perforation, but also without it, for septic micro-organisms can pass through an unruptured appendix if the walls of this diverticulum are in a state of impaired vitality from ulceration or gangrene.

¹ *Lancet*, June 30, 1894. ² Deaver, "Acute Appendicitis," *Med. News*, March 26, 1894.

³ *N. Y. Med. Jour.*, June 30, 1894.

Wyeth says the materia medica possesses no agent that can prevent infection of the peritoneum from a diseased appendix, or that can cure the disease when once established; the surgeon is often called in too late. He says: "In my entire experience with this lesion I have yet to see a death which could not properly be ascribed to delay in timely and skilful surgical interference. With all respect to the diagnostician, I do not believe that it is within the scope of human judgment to determine from the symptoms whether or not perforation or gangrene is about to occur, whether peritonitis with or without perforation is being circumscribed by adhesion or is spreading to general infection."

[The question of when to operate in acute or subacute appendicitis is very much debated. We have just seen that Wyeth would operate on every case. McBurney says that if a mild case "does not begin to improve in thirty-six hours, operate." Swain¹ maintains that in view of the fact that 90 per cent. of all cases recover spontaneously, operative interference is in most cases unjustifiable. He says that operation is indicated when pus has formed, and if there is uncertainty as to pus-formation, operation should be delayed; he says that operation is also indicated in relapsing and in rapidly perforating cases.

Deaver² has grown more radical as his experience has broadened. He says: "Appendicitis is a surgical affection, and should be so treated. The first question that arises after the diagnosis has been established is the character of the attack and what will be the probable outcome. It is here that we come up against the stone wall of fact backed up with logical conclusion based upon experience. We cannot say positively which case or class of cases will recover from an attack, and which will go on to suppuration, gangrene, and perforation. The question is, *Shall we guess, and run the risk at the patient's expense, or will we accept the only alternative, and remove the organ in the incipency of its inflammation?* The operation has been performed so often by skilled surgeons with a mortality of 1 to 2 per cent., and in many instances without a death, that there is absolutely no ground for attacking the procedure upon the score of fatality. Hernia is not a frequent sequence of abdominal section, and is not the bugbear it is thought to be by the opponents of the knife. We cannot accept objections to scientific procedure upon the score of prejudice or on general principles, but must meet facts with facts.

"A record of 100 appendicectomies with one death and no hernias speaks for itself. The records of McBurney of New York, Richardson of Boston, Fowler of New York, Murphy of Chicago, and many others, stand out like the "handwriting on the wall" to substantiate the scientific wisdom of early operation, and to stamp delay as dangerous and unscientific.

¹ Medico-Chir. Jour., March, 1894.

² Paper read before the section on Surgery of the American Medical Association, Baltimore, 1895.

"Early operation is a conservative and not a radical procedure. We are not governed by the same reasons that influence us to perform the radical operation for the cure of simple hernia or for the removal of the uterine appendages for a fibroid. But we see before us the probable consequences of allowing suppuration, gangrene, and perforation to occur in the peritoneal cavity, which may or may not be protected by nature's kindly action.

"The proportion of cases of appendicitis which have one attack and then become perfectly well and are cured of the disease is so infinitely small, compared to those which have repeated attacks with an interval of invalidism, that I do not believe the rare exception should interfere with the rule."

Murphy¹ opposes the conservative idea that teaches only to operate on cases with collapse, or with symptoms of fulminating peritonitis, or when following an unfavorable course. He says that 50 per cent. of fatal cases terminate before the end of the sixth day, many on the fourth day, some even on the second day. He would not delay operation even in cases progressing favorably (that is to say, cases with a temperature not above 99° F., a pulse not above 80, with a good expression, and an abdomen showing no threatening indications), but would operate even on such patients, because they may become suddenly worse and die from a suppurative peritonitis that may have existed during the previously apparently good condition without giving a single sign to indicate its presence. This condition, he tells us, does happen, for there is no symptom or set of symptoms that indicate certainly suppurative peritonitis in the cavity-stage. Murphy's rule is to operate on every case of appendicitis at the earliest possible moment. Rushmore² considers appendicitis to be a surgical disease from the very beginning, and advises operation at the earliest possible moment. White³ believes that operation should be performed in every case of mild appendicitis if the symptoms are worse at the end of forty-eight hours, or earlier than that if the case is a severe one with sharp pain and tympany. He says it is quite true that resolution might occur, but so might localized abscess or general peritonitis.

These citations suffice to show the wide differences of opinion that exist. Dr. Norman Bridge expresses this when he says: "Appendicitis is one of the most frequent and dangerous of the inflammatory diseases in or about the peritoneal cavity. We do not know the line between proper medical treatment and the demand for surgical interference, and I rather despair of finding it. The medical man is practically powerless to control the destiny of the patient. It is always a surgical disease, and the mortality should be materially lessened by skilful surgical treatment." We would maintain that an ordinary mild first attack of appendicitis that improves rapidly should not be operated upon, but every acute and severe case, and every case that

¹ Med. News, Jan. 5, 1895.

² Annals of Surg., May, 1894.

³ Therap. Gaz., June 15, 1894.

does not show improved pulse and temperature at the end of thirty-six hours, should be operated upon. In recurrent appendicitis operation is indicated if the attacks are frequent. Recurrent appendicitis should be operated upon in the intervals, especially if there are local symptoms between attacks. In every case the physician should at once call in a surgeon for consultation, and in every case everything should be in readiness for an instant operation. Keith of Edinburgh declares that the pendulum has swung too far toward the operative view in appendicitis, and that the time is coming, as it has already come in regard to removal of the ovaries, when a definite stand must be made against the indiscriminate removal of the appendix.]

The After-treatment of Operation for Appendicitis.—Burrell¹ treats shock by alcoholic stimulants, heat, enemata of brandy, and hypodermic injection of atropin, strychnin, and digitalin. During the first twenty-four or forty-eight hours the patient is given cracked ice, beef-tea, and a little milk. Opiates may be used with freedom. Burrell maintains that any gain accomplished by free action of the intestines is more than counterbalanced by the loss due to pain, and hence that opium should be used. He states that he lost a patient from the improper use of salines. If bad symptoms continue beyond the third or fourth day, he tells us that the case is hopeless. He thinks salines are indicated after the first forty-eight hours when the pulse becomes frequent or the tongue is seen to be glazed. If there has been vomiting, he gives saturated solution of salts by enema, or uses glycerol-suppositories. If a profuse discharge continues from the wound, or if the temperature progressively rises after the fifth day, or if there be a chill, Burrell says to at once open the wound and explore it.

Classification of Appendicitis.—Barling² suggests a clinical classification of appendicitis that will group together cases requiring similar treatment, namely: mild appendicitis; appendicitis with distinct abscess-formation; acute perforative appendicitis; relapsing appendicitis.

Symptoms of Appendicitis.—Bull³ shows the great variability of the symptoms of appendicitis. He tells us that the attack begins with a sudden pain that at first may be felt in the umbilicus, radiating over the belly and later becoming fixed in the right iliac fossa; but in some cases the pain may begin in the right iliac fossa. The patient may have a single attack of vomiting or may vomit persistently. He sometimes has constipation, but often diarrhea. The exact point of tenderness is not constant, and there may be resistance to pressure or actual tumefaction. Shady⁴ has never seen a case of appendicitis without tenderness in the right iliac fossa, and he says that circumscribed muscle-tension in this fossa will be found in 40 per cent. of the cases; a distinct tumor is rare until the third day after the onset of local pain; percussion-dulness is also rarely found if the appendix is back

¹ Boston Med. and Surg. Jour., May 3, 1894.

³ Med. Annual, 1894.

² Med. Annual, 1894.

⁴ Med. Rec., Jan. 6, 1894.

of the cecum ; fluctuation does not occur until the second week. He gives the following list of diseases with which appendicitis may be confounded : psoas-abscess, morbus coxarius, colic (renal and biliary), tubal and ovarian disease, intussusception, carcinoma of the colon and cecum, perinephric abscess, typhoid fever, floating kidney. Acute cases with sudden peritonitis may be confounded with perforating ulcers of the stomach and intestines and with rupture of the gall-bladder.

Gage¹ has called attention to the fact that hemorrhagic pancreatitis may simulate appendicitis. [Keen has shown that in many cases of appendicitis pressure over the left iliac fossa causes pain in the right fossa.]

Palpation of the Appendix.—Edebohls² maintains that under ordinary circumstances the appendix may be palpated. He says that the general opinion that such palpation is impossible would be founded upon the small size of the appendix, its deep situation, and the character of the structures overlying it. He practised palpation of the appendix in every woman he examined during the year, and in every case in which celiotomy for any purpose was contemplated, and he made a comparison of the condition of the appendix as ascertained at the operation with that found at the previous palpation. The practice of palpation as a routine method in the examination of every woman has led to a recognition of the ease with which the appendix may be palpated. It is best performed in the following manner : After completing the ordinary bimanual examination of the pelvic organs the woman is drawn upward upon the table for a foot or so, her feet still remaining where they were placed for the pelvic examination. This is done for the purpose of unfolding the bend of the thigh upon the abdomen and of rendering the right inguinal region accessible. One hand only applied externally is required for the palpation of the appendix, the examiner standing at the patient's right side. He begins the search for the appendix by applying two or three or four fingers of his right hand, palmar surface downward, flat upon the abdomen at or near the umbilicus. He then draws the examining fingers over the abdomen in a straight line from the umbilicus to the anterior superior spine of the right ilium, and notes the character of the structures as they escape from beneath his fingers. In doing this the pressure must be deep enough to recognize along the whole route the resisting surfaces of the posterior abdominal wall and the pelvic brim. The firm posterior wall of the abdomen at this point, the iliac fossa, and the pelvic brim form the surfaces for counterpressure. Good guides in searching for the appendix are the right common and external iliac arteries, the pulsations of which can be easily felt, the base of the appendix usually being almost immediately outside of these vessels and separated from the vessels by a space of from half an inch to an inch, while lower down the appendix crosses obliquely the line of the arteries.

¹ Boston Med. and Surg. Jour., May 24, 1894.

² In a paper read before the Medical Society of the State of New York.

Edebohls tells us that proceeding in this manner the appendix is recognized as a flattened, ribbon-shaped structure when quite normal, or as a rounded and firm organ of varying diameter when its walls have been thickened by inflammation. When it is the seat of inflammatory changes the appendix is always sensitive on pressure whereas the normal appendix exhibits no special sensitiveness on being squeezed. Edebohls maintains that, with the very rare exception of its situation away from its usual site, the origin of the appendix vermiformis is practically always found at what is known as McBurney's point. [In commenting upon this article we would express our conviction that in many cases it is quite possible to palpate the appendix, but in regard to the seat of the appendix being so definitely fixed we would dissent. The appendix may rise from the apex of the cecum; it may rise from the lower end of the cecum, the apex being rotated posteriorly to the left; it may rise from the lower end of the cecum, appearing between two bulging sacculi, and being posterior to the inferior angle of junction of the cecum and ilium; and in cases of nondescent of the cecum the appendix will hold an abnormal position, when it may lie even to the left of the median line. Dr. J. D. Bryant states that as a matter of fact the appendix may normally assume a great many positions, and that the most frequent direction of the appendix is inward toward the median line or forward toward the pelvis, and that in 23 per cent. of instances the appendix is normally rotated behind the cecum. Jacob examined 80 cadavers in which the usual position of the appendix was found to be outside of the cecum and in a horizontal position. In all the cases of appendicitis in which the condition was diagnosed the appendix was found behind the cecum or extending down into the pelvis. Therefore the author thinks this position behind the cecum and extending into the pelvis predisposes to appendicitis because of the necessary stagnation of feces. Dr. Henry C. Coe says that to palpate the appendix by external manipulation is under many circumstances a procedure requiring the exercise in a high degree of a scientific imagination. It can be done in many cases, but we feel sure by no means in every case. It is, however, often useful, and the attempt should be made.]

The Abdominal Incision.—McBurney¹ discusses the proper incision to be made in the abdominal wall in appendicitis. He says that surgeons are practically unanimous in discarding median incision. In the old method of operating, the muscles are cut across their fibers rather than with them, and as a result of this, incomplete repair takes place, and hernia is likely to follow. His method of operating is as follows: The skin-incision is oblique, about four inches long, crossing at a right angle a line drawn from the spine to the umbilicus, and about an inch from the spine. This incision is a little to the outer side of the normal situation of the appendix. The fibers of the external oblique muscle and its aponeurosis are not cut, but are separated

¹ *Annals of Surgery*, July, 1894.

with great care in the direction in which they run. When the edges of the wound of the external oblique are separated with retractors a considerable expanse of internal oblique muscle is seen, the fibers of which cross somewhat obliquely the opening formed by these retractors. With a blunt instrument the fibers of the internal oblique and transversalis muscles can be separated without cutting more than an occasional fiber in a line parallel with their course—that is, nearly at right angles to the incision in the external oblique aponeurosis. Blunt retractors are now introduced, and these expose the transversalis fascia, which is then divided in the same line; last of all, the peritoneum is divided.

McArthur¹ advocates the same method of operating as is set forth by McBurney. He states that in opening the abdomen two factors should influence the direction of incision—the innervation of the muscles to be incised, and the direction of the muscular fibers to be penetrated. It has been the custom in the past to cut all layers of the abdominal wall in any direction, giving the greatest accessibility to the organs to be reached, without regard to either of the factors mentioned. McArthur assigns to Kocher the credit of emphasizing the importance of the selection of the direction of incision in regard to skin-cleavage and vascular supply, thereby rendering it possible to avoid traumatic paresis of the cut muscle, its subsequent degeneration and atrophy, and the formation of a ventral hernia in the abdominal walls. The author affirms that Langer's investigation as to the direction in which the skin splits shows that the tension of the skin varies greatly in two different directions: McArthur says: "Two incisions at right angles exhibit a varying retraction of the wound-margins; while one gapes widely, the edges of the other remain in contact almost without artificial aid. This fact should be borne in mind in choosing the direction of the incision, unless other factors have a determining effect in the concrete case, for the course of the vessels, and especially of the larger and smaller nerve-twigs, is even more important for the direction of the incision. Fortunately, the course of the nerves and vessels coincides with the direction in which the skin shows the greatest tension, so that a cutaneous incision adapted to the cleavage-lines corresponds also with the course of important nerves and vessels. Who in making incisions in the extremities would think of making them transverse to the general nerve-supply? Yet such is done daily; for example, when making perpendicular incisions through the linea semilunaris, by which the rectus muscle in such of its extent as parallels the cut is deprived of its nerve-impulse. I would add to Kocher's instructive work this farther modification, that when feasible the muscular structures be not cut, but that their fibers be separated transversal to their two general directions—the fibers of the external oblique in its direction, the fibers of the internal oblique and transversalis in theirs. In a large proportion of cases this will afford enough room for most abdominal opera-

¹ Chicago Med. Rec., Nov., 1894.

tions not made best in mesial line; will not result in a paralysis of the distal portions of the commonly severed muscles; will avoid future hernia; and will require but little or no stitching."

Appendicitis Complicated with Disease of the Adnexa.—Coe in an instructive article¹ calls attention to the fact that appendicitis is a not infrequent complication of disease of the adnexa, some cases being secondary to diseases of the adnexa. Some cases of ovarian abscess without external septic infection are secondary to appendicitis.

Appendicitis with Abscess.—Wyeth² has recorded an instructive case of appendicitis in which upon opening the peritoneal cavity a large mass was discovered adherent to the abdominal wall; it was evidently an abscess due to perforation of the appendix, the walls of the abscess being made up of plastic lymph thrown out in advance of the inflammatory process. Wyeth recognized that any attempt to remove such a large mass by dissection would lead to rupture and infection of the peritoneal cavity. The whole mass was lifted to the patient's right side, and the contiguous surface of the omentum was stitched to the wall of the incision in the abdomen in such a way that it shut off from the general peritoneal cavity the proposed site of opening in the abscess. Sutures were applied upon the outer side of the abscess-wall, and this was also stitched to the incision. Iodoform-gauze was packed into the wound, which was left open, and further operation was postponed for forty-eight hours in order to secure firm adhesion of the abscess-wall to the margins of the incision. Forty-eight hours later the abscess was easily opened, and the patient made a rapid recovery.

Termination of Appendicitis.—Fowler³ states the modes of termination of cases of appendicitis to be—1. Perforation without formation of proper adhesions, thus causing septic peritonitis. 2. Infection of the peritoneum through the lymphatics or other channels for microorganisms (the serous effusion may be encysted, and later purulent or nonencysted, occupying the general peritoneal cavity). 3. Rupture of the appendicular abscess, with subsequent peritonitis. 4. Septic conditions arising from extension to and invasion of the retroperitoneal connective tissue. 5. Gangrene of the appendix, of the adhesions about it, and of the neighboring parts, including even blood-vessels—in the latter case giving rise to fatal hemorrhage. 6. Pyelophlebitis, hepatic abscesses, with their sequelæ, purulent pleuritis, pneumonia, etc. 7. The purulent accumulation opening into the cecum, the rectum, or the bladder. He also mentions that the following conditions may be associated with appendicitis: iliac phlebitis, iliac thrombosis and hemorrhages, hepatic abscess, purulent pleuritis, purulent pericarditis, fecal or urinary fistula, pelvic, lumbar, or parietal phlegmon.

¹ The Physician and Surgeon, Nov. 1894, taken from the New York Polyclinic.

² Jour. Am. Med. Assoc., Dec. 22, 1894.

³ Annals of Surgery, March, 1894.

Technic of Operation for Removal of the Appendix.—Barker¹ some years ago noticed that the mucous and submucous coats of an inflamed appendix lay rather loosely within the outer coats close to the cecum, and after circular division of the outer coats could be drawn out for an inch or so. This observation led him to devise a new method for treating the stump. When the appendix has been separated from its surroundings, transfix its mesentery, tie it with fine silk, and cut the mesentery up to the base of the appendix and close to the cecum. About three-quarters of an inch from the cecum make a circular sweep of the knife and divide the serous and muscular coats. Draw out the mucous tube, and at the same time strip the two outer coats back toward the cecum and turn them over like the sleeve of a coat. Tie the mucous tube with silk at its point of exit from the cecum, and cut it across one-eighth of an inch below the ligature; it will at

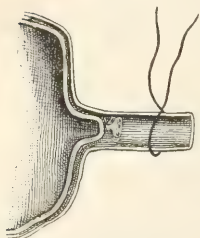


Fig. 7.—Barker's technic of operation for removal of the appendix (*Brit. Med. Jour.*, April 20, 1895).

once retract. Turn down the outer coats over the stump of the mucous coat, surround the seromuscular tube with a silk ligature, and tie. [This method of Barker saves the time and labor of stitching the serous coat over the stump, and is unquestionably an improvement in technic. Time is money in the business world, time is often life in abdominal surgery. This operation obviates entirely the necessity of inversion of the stump as practised by Edebohls.]²

HERNIA.

Strangulated Hernia.³—The statistics of 940 cases of herniotomy at St. Bartholomew's, St. Thomas's, and Guy's Hospitals in London, up to 1884, show a mortality of 43 per cent. Mr. Croft makes a collection of the statistics of his cases from May, 1866, to October, 1892, and he arranges them into two groups: first, those operated upon prior to antiseptic methods; second, those operated upon with antiseptic care. In the last series there were 44 cases with a mortality of 29½ per cent.; in the first series the mortality was over 50 per cent. In the 13 cases of death in which operation was done antiseptically Croft found that 9 were due to exhaustion from protracted suffering and old age, and in 3 of these the intestine was gangrenous, and 5 were almost in articulo-mortis at the time of operation. There was not a death in this group from peritonitis. Croft maintains that patients die after herniotomy because the operation is done too late, and not because of the operation; and Bowlby holds that death is due to exhaustion from starvation of days' duration, vomiting, and pain, and that the high rate of mortality is

¹ *Brit. Med. Jour.*, April 20, 1895.

² *Am. Jour. Med. Sci.*, June, 1895.

³ *The Hospital*, vol. xvii., 1895.

due to the long period often allowed to elapse between the beginning of strangulation and the operation. Strangulations operated upon in the first twelve hours show but a trifling mortality, but when operation is postponed for several days the chances of recovery are small. [The statement has been made by Treves and others that the mortality after herniotomy has not diminished since the advent of antiseptis, but Croft's cases show that liability to peritonitis has very greatly lessened, and Bowlby makes the same claim.]

Herniotomy and Strangulated Hernia of Infants is discussed by Stern,¹ who presents the records of 51 cases of inguinal herniotomy to add to the 87 cases previously reported by Knobloch. In addition, 3 cases of umbilical hernia are set forth. All of these cases occurred in those who were not beyond the fourth year of life. In Knobloch's 87 cases 50 patients were less than 1 year of age. In Stern's 51 cases 34 were under one year of age. Stern recommends in all the grave abdominal diseases of childhood to examine hernial openings. He states that while the symptoms are practically identical with those noted in adults, there is one striking feature, namely, retention of urine, a symptom that Paget has shown is extremely rare in adults as compared with children. Stern also calls attention to the possible mistake of confusing strangulated inguinal hernia with hydrocele. He makes a study of the prognosis, and shows that of 44 cases occurring within the antiseptic and aseptic period, 6 proved fatal, a mortality of 13.6 per cent. This is a better result than is given for the operation in adults, and is to be explained by the fact that in the latter the operation is frequently performed on old and exhausted subjects in whom anesthetization adds a grave element of danger. Stern strongly recommends early operation. He says that if warm baths and inversion fail to accomplish reduction, an anesthetic is at once to be given, and if this is without result an operation is to be undertaken without loss of time. A number of these patients continued to be nursed by the mothers and were treated as out-patients, being daily brought to the clinic for redressing.

The Radical Cure in the Operation for Strangulated Hernia in the Aged.—O'Callaghan² presents the records of three cases in which there was a highly successful issue. He says that his experience is that patients who in the ordinary course of life are destined to live to eighty—or, in other words, in whom old age is their only infirmity—bear a critical operation better than most middle-aged people, especially women; his explanation is that old people live in a state of mental and physical repose, and have no nervous susceptibility, every organ being in a state of quiescence and no waste tissues favoring suppuration. [Readers may recall an article³ by Dr. George Murray Humphrey, the distinguished authority upon old age. He offers some remarks upon the repair of wounds and fractures in aged persons, and says:

¹ *Centralbl. f. Chir.*, May 12, 1894.

² *Provincial Med. Jour.*, Jan. 1, 1895.

³ *Brit. Med. Jour.*, July 12, 1884.

"I have frequently noticed that the repair of wounds and the healing of ulcers takes place as quickly as in middle life, and, indeed, more quickly." He gives the results of a collective investigation upon a small scale which were confirmative of this view. He remarks that this statement must be qualified in a manner that savors rather of the paradoxical—namely, that wounds in old people heal quickly provided they do not slough; that is to say, the apparent opposite tendencies exist at this time of life, namely, the tendency to slough and the tendency to heal quickly. Such, for instance, is the experience of oculists whose testimony he has asked. They find that the cornea sometimes sloughs after an operation for cataract in old people, but that when it does not slough the wound heals quite as quickly as, or more quickly than, at an earlier period of life. So in other operations an old person may sink, or the wound may slough or ulcerate, but if these accidents are escaped a quick healing may be expected.]

The Return of Gangrenous Intestine.—O'Callaghan also discusses the old question, When is a surgeon justified in returning an apparently gangrenous intestine? He takes the view that no matter how black and gangrenous a portion of the intestine may look, if at the point of constriction one finds a graduated line of blackness extending into the healthy intestine, he is safe in returning it, but if there is a distinct straight line between the healthy and the unhealthy tissues, it is unsafe to return it. He determines this point by douching the sac and intestines for several minutes with hot water at a temperature of from 112° to 115° F. This renders them aseptic, causes relaxation of the constriction of the intestines, and if any vitality remains in the latter, it stimulates it. He then severs the constriction, draws out the healthy intestine on each side of the loop, and continues the douching for at least five minutes, when, if the line of demarcation is not distinct, he clearly observes the vitality returning in the damaged portion. He discusses the proper mode of action when a determination is reached that the intestine is not in a condition to be returned. He says there are only two methods worth speaking of—the creation of an artificial anus, and resection with suturing and immediate return of the intestine. He states that enterotomy, or the formation of an artificial anus, is a very simple and rapid procedure, that these facts constitute its only advantages, and that the operation should be practised only when collapse is very great and rapidity in treatment is absolutely urgent. He considers that the operation possesses numerous disadvantages, among which are thickening of the intestinal walls, and peritonitis from fecal infection—a most horrible infirmity that requires serious subsequent operation to relieve. He estimates the mortality at 65 per cent. He considers resection with suturing and immediate return of the intestine as the best method of dealing with this complication. Zeidler gives the statistics of 289 primary resections, with a mortality of 49 per cent., and 287 cases with the formation of an artificial anus, with a mortality

of 74 per cent. [This seems to antagonize the general view that the operation of enterotomy is safer than that of primary resection, but it is to be remembered that enterotomy is only applied to the very worst cases—in other words, to those most liable to die—and that the death is attributable more often to the condition of the patient than to the effect of the operation. Kendal Franks of Dublin estimates the mortality as 80 per cent., but in the cases in which this operation is necessary, if primary resection were attempted, the mortality from the latter procedure would probably be 100 per cent.]

O'Callaghan makes the following important assertion: A patient should never be allowed to die from strangulated hernia, no matter how collapsed, without operation, for even in the most hopeless-looking cases success may be attained. [Before operating, be careful to determine that a hernia is strangulated. When a hernia gets caught, though it is not strangulated, positive disturbances, especially of the nervous system, are likely to arise. The patient becomes much alarmed and constipated, and flatus arrests peristalsis and prevents reduction. Such cases readily submit to taxis.]

Treatment of Gangrenous Hernia is discussed by Chaput,¹ who advises resection with circular enterorrhaphy. Second approved the making of an artificial anus. His 3 cases of resection had all died of shock. Of 8 cases in which an artificial anus had been made, 4 died in three or four days, and the other 4 in the course of several weeks, 1 of renal disease, and 3 of pulmonary troubles. He maintains, however, that in the latter cases the operation had nothing to do with causing the death. Terrier stated that the operation of enterorrhaphy, as generally practised, was excessively severe and prolonged and could not be used in this class of cases, but that Murphy's button gave the best statistics of recovery, and he would therefore recommend a thorough trial of this. Kirrison agreed with Terrier that enterorrhaphy was a protracted, grave operation, and for this reason defended making an artificial anus, with its subsequent closure. Championnière maintained that an artificial anus is a much more serious operation than enterorrhaphy, and stated that 80 per cent. was the mortality for artificial anus, and that 30 per cent. of the remainder subsequently died. His conclusions were, to make extensive resections; not to employ any method that narrowed the gut-lumen; to leave the intestine outside between layers of iodoform-gauze; and not to use chloroform. Mikulicz lost only 30 per cent. of cases operated upon by this method, and Murphy lost only 1 case in 8 in which he practised resection and approximation by his buttons.

Umbilical Hernia in Children is discussed by Cahir,² who lays down a series of rules for the treatment of umbilical hernia in infants and young subjects. In children below the age of eighteen months attempts at cure should be made by the use of a pad and bandage, a flat pad being preferred to a conical one. Children from two to seven years of age and belonging to prosper-

¹ Bull. et Mem. de la Soc. de Chir., xx., p. 381.

² Rev. de Chir., April, 1895.

ous people should be treated in a similar manner, but if the parents be very poor or ignorant it will be entirely useless to attempt to cure by such means. If during the application of the pad and bandage, bronchitis, whooping-cough, or laryngitis occur, the treatment must be intermitted while the respiratory trouble lasts and renewed after its cure. Operative treatment is recommended in the following cases: 1. When a hernia in an infant causes strangulation, or is associated with persistent gastrointestinal disorders that cannot be assigned to any other cause. 2. In young subjects from two to seven years of age in whom like symptoms are caused by the hernia. 3. In children from two to seven years of age, who, in consequence of improper means of retention or of careless treatment, remain with a hernia in the same condition after the use of the pad and bandage for twelve or eighteen months. 4. In children over seven years of age suffering from an irreducible hernia that gradually increases in size. 5. When the skin ulcerates and inflames. 6. When the existence of a hernia will interfere with the patient's future career in any special line of work. 7. When a hernial ring is very large. 8. When the patient is subject to strangulation or to attacks of inflammation. 9. When a hernia seriously impairs the subject's development by causing pain and gastrointestinal disturbances.

"Coughing Taxis."—Wherry¹ discusses the value of what he calls the coughing taxis in the reduction of hernia. He advises that the patient be recumbent, with the buttocks raised and the thigh flexed on the abdomen, while the surgeon sits by the bedside, and during the whole of the time that taxis is used the patient is made to cough, only stopping for rest or because of retching, the operator's efforts being continued even during the pauses of the cough. His pressure will be aided by every cough of the patient, and some advantage is gained by the act of retching. The hernia is not unusually reduced, and rather by the coughing of the patient than by the taxis of the operator.

Reduction of Hernia by Abdominal Sections is considered by Neuber.² A patient had a scrotal hernia in which was about one-fourth of the entire intestine. The size indicated that reduction by the usual method would be long and difficult, especially if adhesions existed. The operation was by an incision from the external ring, upward and outward, toward the anterior superior spine. A large amount of sterilized gauze was then placed in the iliac fossa, so as to absorb any fluid that might escape when the bowel was reduced, as it was feared that this fluid might be infected from the bowel, especially if there were either gangrene or perforation. The omentum was not adherent, but there was such swelling that it would have been hardly possible to reduce by the usual operation. The patient was then placed in the Trendelenburg position, and the reduction of the intestine easily effected by traction and light compression of the scrotum. A radical

¹ Gaillard's Med. Jour., March, 1894.

² Centralbl. f. Chir., page 649, 1894.

cure was then undertaken by uniting the edges of the sac (6 to 7 cm.) by catgut. Two folds of the abdominal wall were then united on each side by catgut sutures. The advantages of this method in certain cases Neuber points out are as follows: 1. The difficulty of recognizing the wall of the sac and the possibility of accidentally wounding the walls of the intestine are avoided. 2. No mistake can be made between direct and oblique inguinal hernia, nor can the deep epigastric artery be wounded, since it is out of sight. The difficulty in reduction of the hernia by this position and method of operating is greatly lessened. 3. The removal of a large quantity of the omentum (a matter of some moment) is avoided. 4. No other method enables us to make so thorough a determination of the condition of the herniated portion of the bowel. 5. If peritonitis has set in, it can be properly treated. 6. Reduction en bloc cannot take place. 7. If, as is rarely the case, the hernia is of the properitoneal variety, the diagnosis and proper treatment are assured.

Strangulated Diaphragmatic Hernia.—Rochard¹ discusses the question whether the reduction should be made by the abdominal or the transpleural route. He advises the latter, because the operation is easy, and because reduction through the abdomen is not always easy, the freeing of the bowel being dangerous when one is operating at the bottom of the left flank and using the knife in the midst of surrounding intestines. The operation he advises is one that he has only performed on the dead body. His directions are as follows: Place the patient in the left lateral decubitus, with a cushion under the right flank in order to make the left costal flank project, making a U-shaped, T-shaped, or an H-shaped incision about six inches long at the level of the ninth rib. Raise a musculocutaneous flap, divide the ninth rib and excise it, or raise it with the deep soft parts. Open the pleura. The lung will retract by itself, and the arch of the diaphragm will be seen within easy reach. Herniotomy is to be conducted as usual, the sac being opened, and a radical cure is to be performed as elsewhere, the sac being excised, the edges of the opening freshened, and a row of sutures, comprising muscle-tissue and pleura, being inserted. The pleura should be carefully cleaned, the wound in the thoracic wall closed with antiseptic care, and the abdominal wound, which during these procedures has been closed with a sponge, should now be sutured.

The Radical Cure of Hernia.—Larimore² claims that the mortality is only .86 per cent.; that relapses occur in but 7.5 per cent.; that the sac should always be opened and its contents examined, and that omentum should usually be resected; that the obliquity of the inguinal canal should be restored by two rows of deep continuous sutures; that the integuments should be closed with a buried suture; that the dressing should be of iodoform-collodion; that the patient should be kept in bed from three to seven days, and that no truss should subsequently be worn. [Retention in bed for only

¹ L'Union Médicale, No. 67.

² Jour. Am. Med. Assoc.

a few days is much to be deprecated ; it is far better and far wiser to make a man lie upon his back for four weeks after an operation for the radical cure of hernia.]

Bassini's Operation.—Fowler¹ discusses Bassini's operation for the cure of femoral hernia. He describes the operation as follows : Expose the sac with the fascia lata and the pectineal fascia by an incision parallel to and just below Poupart's ligament. Isolate the sac and its neck to a point above the crest of the pubis, open the sac, catch it by a clamp to prevent untwisting, pass a ligature around the twisted portion, and securely ligate the neck. Cut away the part of the sac beyond the ligature, and replace the stump so as to close the parts forming the canal and also the ring. These parts are closed as follows : a suture is applied close to the spine of the pubis, and passes through Poupart's ligament, which ligament is somewhat elevated, and a suture is passed to include the pectineal fascia at the level of the pelvic crest, and several sutures are placed in a similar manner approaching the crural vein. The fourth suture includes the falciform process of the fascia lata and the pectineal fascia. No suture is tied until all are introduced, and the sutures first placed are tied first. The consequence of this method is a suture-line in the shape of the letter C. The skin is sutured separately. Bassini's statistics for this operation show 54 operations in 51 people ; 8 left the hospital within nine days, 12 after ten days, 5 after eleven days, and 4 after twelve days ; the remaining 21 left in from thirteen to twenty days. None of the patients have worn a truss since, and each one is able to work. In at least 41 cases the cure remained permanent for periods extending from two to nine years.

Closure of Mouths of Femoral Herniæ.—Haackenbeuch² discusses the difficulties met in closing the mouths of large femoral herniæ. He adopts in a modified form the osteoplastic operation originated by Trendelenburg. A long oblique incision is made that opens the region around the mouth of the hernia ; it begins at the tubercle of the pubis on the healthy side, or runs along the symphysis and the anterior inferior spine of the affected side. If the hernia is very large, a vertical incision is made downward from the middle of the first cut upon the front of the thigh. The sac is either freed entirely, ligated, and returned, or it is opened, and, after the loosening of adherent portions of intestine and resection of the omentum, is partially removed, the neck being sutured with catgut and the stump returned into the belly. The replaced sac is to be sutured to Poupart's ligament and to the abdominal wall with catgut. An osteoplastic flap is now formed on the upper surface and anterior border of the horizontal ramus of the pubes, and the rectus muscles are cut. On the inner surface of the descending ramus of the pubis of the affected side the fibers of the gracilis and adductor magnus are partially cut. A wide chisel is placed upon the healthy side about 1

¹ Brooklyn Med. Jour., No. 6, vol. 8.

² Berl. klin. Chir., 11, No. 3.

cm. from the symphysis on the anterior surface of the pubic bone in such a position that a periosteum-bone-cartilage flap, about 2 cm. wide and several mm. thick, may be removed from the anterior surface of the pubic bones and symphysis. This flap is allowed to remain attached at the tubercle of the pubis on the affected side. Care is taken that the femoral vein is not injured by the chisel. The flap is now lifted and turned so that the periosteum is on the posterior or lower side and the cut bone-surface is in front. The flap fits into the mouth of the hernia, its upper end being brought behind Poupart's ligament, and attached to this ligament by catgut sutures, and several catgut sutures being used to fasten the stump of the sac to it. The femoral vessels pass under the lower outer border of the bone and do not suffer from pressure. A small incision is made in the skin at the inner and upper portion of the thigh to permit drainage of the wound-pocket in front of the symphysis. One or two drainage-tubes are used. Sutures are inserted and compression is applied, with a dressing. Union usually occurs by first intention.

A New Method for the Radical Treatment of Femoral Hernia is described by Fabricius.¹ He makes an incision five inches long from the insertion of Poupart's ligament upon the pubes, parallel with the ligament, extending through the superficial fascia, and exposing the superficial epigastric vein. If the hernia passes under the lesser falciform process, the sac will now be seen. If it passes beneath the superficial layer of the fascia lata, that will have to be cut before the sac is noticed. The hernia is now to be reduced, the sac ligated and cut off, and the stump turned into the abdomen. If the constriction is very great, Poupart's ligament should be divided at its insertion at the edge of the horizontal ramus of the pubes, or, when it is possible, should be cut on Cooper's ligament. The subsequent relaxation following this incision will permit of complete exploration of the hernial canal and the removal of any lymphatic glands or tissues, and will render easier any subsequent suturing. After the crural sheath has been freed it is pulled outward from the ileopectineal portions while Poupart's ligament is sutured to the horizontal ramus of the pubes. A sharp, curved needle is used, and the stitch includes about three-eighths of an inch of tissue above Poupart's ligament, the horizontal portion of the pectineal fascia, the primary fascicles of the pectineal muscle, and the periosteum. In inserting the first stitch next to the large vessels, care is taken to avoid the inferior epigastric artery and vein. Poupart's ligament should be sutured to the pubic spine, uniting it again to the inner border of the horizontal ramus, care being taken to include the periosteum. The superficial portion of the fascia lata may or may not be sutured to the pectineal fascia. In order to prevent inguinal hernia the pillars of the external ring should be sutured.

The Radical Cure of Umbilical Hernia.—Championnière² states his

¹ *Centralbl. f. Chir.*, Bd. 6, 1894.

² *Rev. de Chir.*, Nov., 1894.

conviction that umbilical hernia tends to become of enormous size, causes great discomfort, is never completely retained by truss or bandage, assists in bringing about rapid organic failure, marked by diabetes, albuminuria, and premature senility, and that this form of hernia is almost always complicated with obesity and emphysema of the lungs. He says that when the hernia has become very large it is no longer curable by operative methods, as the swelling will almost certainly return through the large opening formed by operation through the wall of the abdomen, but in cases of small umbilical hernia a solid and enduring cure may be effected by operation. The main objects in the treatment of this form of hernia are to remove the sac, to secure its pedicle, and to close the orifice in the abdominal wall by rows of sutures in order to establish a firm cicatrix. In most cases in which the sac is removed the umbilicus must be excised. He believes in removing large masses of omentum in order to reduce the tension of the abdominal wall and lessen the chance of relapse. The opening in the peritoneal cavity is closed by five rows of sutures—one for the peritoneum, one for the skin, and three for the different muscular layers. In this paper he speaks of *epigastric hernia*, upon 11 cases of which he has operated. This differs from umbilical hernia in one important fact—that it has scarcely any tendency to increase in size. It is usually painful, and is often accompanied by vomiting and intestinal troubles. The palliative treatment is not entirely satisfactory, but the condition can be effectually cured by operation. The hernial orifice should be freely incised, and the sac should be separated from adjacent parts and removed, along with any omentum it may contain. The pedicle of the sac is ligatured very far back. The hernial opening is closed by three rows of sutures—one row for the skin, one for the peritoneum, and one for the under portions of the abdominal wall.

Omphalectomy for Umbilical Hernia.¹—Bruns advocates Condamin's operation somewhat modified. A skin-incision should be made about one side of the hernial tumor, commencing and ending in the middle line. This incision is outside of the ring and exposes the peritoneum; the inner edge with the hernia is drawn aside, and the ring exposed. The ring and the sac are divided transversely. This procedure allows ready access to the interior of the sac, and the operator can without trouble examine and reduce its contents. After reduction is accomplished an exactly similar incision upon the other side completes the excision of the sac and the ring, which are removed together. The abdominal wound is closed by deep sutures passed entirely through all the layers, and the peritoneal suture is reinforced by superficial skin-sutures.

Operative Treatment of Hernia in Children.—Coley² contributes a valuable article upon this subject, in which he reports 133 cases under fourteen years of age. He quotes Macready ("Treatise on Ruptures"), who says:

¹ Centralbl. f. Chir., 1894, Bd. 21.

² Am. Jour. Med. Sci., May, 1895.

"Many boys are cured by mechanical treatment, but the prospect of cure is more favorable in girls. The younger the patient the better the prospect of cure. After thirty years of age cure is not to be expected in either sex or in any kind of hernia." The London Truss Society's records show that 33 per cent. of ruptured children are uncured by trusses, and Macready considers the number to be even larger. These statements prove, Coley claims, that many cases need other than mechanical treatment, and the point to determine is, Can these cases be cured by operation without any considerable risk? Coley stated in 1893 that, in his opinion, radical operations stand or fall according as they fulfil two conditions (except emergency): first, a mortality either nil or not greater than would be associated with the condition if operation were not done; second, a reasonable hope of cure or relief. The older operations did not fulfil these conditions, but the more recent methods (Bassini's, Halsted's, etc.) do fulfil them. The indications for operation in children are: 1. Cases of adherent omentum. 2. Cases complicated with reducible hydrocele. 3. Cases irreducible or strangulated. 4. Cases unable to obtain the cure demanded by mechanical treatment. 5. Cases in which mechanical treatment has failed after prolonged trial. The best suture-material is kangaroo-tendon, which was originally employed by Marcy. Coley prefers Bassini's method. Out of 114 cases operated on by this method there was but one death, and that was due to ether-pneumonia; out of 112 cases of Bassini's operation, in which kangaroo tendon was the suture-material, not one relapse occurred.

[In the foregoing article Coley very justly condemns catgut, and proves that it fails to fulfil the necessary conditions. The hernial canal is closed by tendinous material, and this form of union requires ten weeks. A catgut suture will be absorbed long before ten weeks; a kangaroo-tendon suture will last for about this period of time. We quite agree with him in his dislike for buried sutures of silver wire and silk, which may act as foreign bodies. Nevertheless, Halsted and others have had great success with wire.]

The Operative Treatment of Hernia is presented by Halsted,¹ who tells us that the cord is the first cause of the hernia and the real obstacle to its cure. The larger the cord the greater the danger of recurrence. The size of the cord depends chiefly upon the veins, and so we should diminish the size of the cord by removing the superfluous veins. Halsted explains the technic of his most valuable operation. He uses the mattress-suture and closes the skin with the subcuticular stitch. He has operated 165 times without a death. Nearly all the cases healed by first intention, and in not one of these cases has recurrence been found. For about one year he has sewed all his hernia-wounds with silver wire and has covered them with silver foil. Every wound healed *per primam*. He is convinced that the use of silver as a suture-material contributes to the good result. Tests have been

¹ Am. Jour. Med. Sci., July, 1895.

made by Halsted and Bolton as to the effect of silver on the growth of pyogenic organisms. If a Petri plate be inoculated with *staphylococcus pyogenes aureus*, and a bit of silver foil be placed in the center of the plate, the following interesting phenomena are noted: Outside of the foil and completely surrounding it a perfectly clear zone will remain; just outside of this there will be a zone of slightly impaired transparency, but the rest of the plate will become uniformly cloudy because of the growth of micro-organisms. Dr. Bolton has studied the inhibitory action of various metals upon the growth of organisms. He finds that cadmium, zinc, and copper are more powerful than silver. Halsted says he does not hesitate to use buried sutures of silver wire in sewing tissues on the borders of infected regions. For instance, in acute suppurative appendicitis he closes the wound in the abdominal wall with interrupted buried sutures and drains with a strip of gauze.

[These observations upon silver are of great importance. We have long appreciated this material because of the ease with which it can be disinfectant and its unirritating action upon the tissues, but we now have an additional reason for its employment in the discovery by Halsted and Bolton of its inhibitory action upon the growth of pus-organisms. In regard to Halsted's operation, it is to be considered as the best method of radical cure yet devised. It is not a modification of the Bassini operation, for both of these distinguished surgeons arrived at their conclusions independently. In Halsted's method the cord is placed outside of the aponeurosis of the external oblique; in Bassini's method it is placed under the aponeurosis. In Halsted's method the superfluous veins are removed; in Bassini's they are allowed to remain. In the first method the obliquity of the inguinal canal is restored; in the second method it is not restored.]

A long and thoughtful paper upon the radical cure of inguinal and femoral hernia is contributed by Fergusson.¹ He takes up for consideration some of the chief operations that are in vogue, and marshals the objections that may be lodged against each. His objections to Bassini's operation are that the sac is cut off; that the triangular depression where the vas deferens and vessels meet to form the spermatic cord is left unprotected except by peritoneum; that supernumerary veins, should they exist, are not removed from the cord; and that all the aponeurotic structures are not sewed behind the cord. His objections to Halsted's operation are that the sac is not utilized; that in tying the six or eight mattress-sutures eversion is effected that leads to a certain amount of concavity along the whole line of suture; that the V-shaped incision where the vas deferens and vessels come out is not strengthened; that there is too much cutting of important structures above the internal ring—it is practically a celiotomy.

Fergusson advocates an operation that he holds combines some of the merits

¹ Chicago Med. Recorder, April, 1895.

and excludes some of the objections to former procedures. He makes an incision three or four inches in length, parallel to Poupart's ligament and over the inguinal canal to the pubic spine. All the structures in front of the canal from the internal to the external ring are divided and the blood-vessels are secured. The sac is dissected, is almost invariably opened for inspection, and its neck is loosened from the deep attachment. The sac is then several times transfixed in the proximal direction with a stitch that has been firmly secured to the distal end, so that when the proximal end is pulled upon the sac will be drawn into folds. The needle carrying this thread is

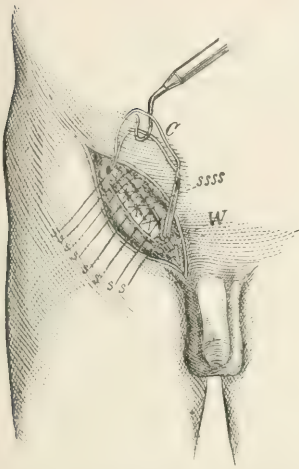


Fig. 8.—Fergusson's operation: *S*, sutures closing the canal; *C*, cord; *W*, veins excised; *ssss*, sutures in transversalis fascia tied (Chicago Med. Recorder, April, 1895).

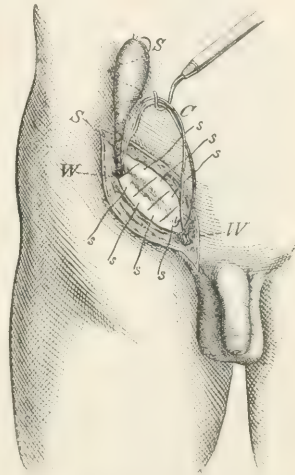


Fig. 9.—Fergusson's operation: *S*, Sac; *Su*, suture in the sac; *W*, veins excised; *ssss*, sutures in *Y*, restoring the internal abdominal ring (Chicago Med. Recorder, April, 1895).

pushed through the abdominal wall from within outward along the finger, which is inserted between the peritoneum and the transversalis fascia, and this needle comes out subcutaneously at the upper angle of the wound, about an inch above the internal ring. It is to be borne in mind that this needle does not penetrate into the peritoneal cavity. Before fastening the sac it is best to raise the spermatic cord and remove the supernumerary veins, as does Halsted. When these veins are not present, it is often well to make a circular incision through the fascia propria of the cord and penetrate it at the new internal ring. The suture holding the sac is now pulled tightly and fastened to the external oblique muscle. It will be noticed when the cord

is raised that the tampon formed by the stump of the sac occupies a position where the vas deferens and vessels meet, and more than fills the infundibuliform space. The next step in the operation is to suture the transversalis fascia, from close to the pubic bone to the root of the cord, with three or four inversion-sutures. When the internal ring is not much enlarged and the transversalis fascia is but slightly relaxed, only a couple of stitches may be needed, the last one completing the formation of the new internal ring.

The inversion-suture is inserted by twisting the deep fascia parallel to Poupart's ligament in two places, from without inward and from within outward, with the first bite of the needle. The needle is drawn through it, and the threads are drawn across to the border of the conjoined tendons, where a similar bite is taken. When these sutures are passed and tied, the tensity of the transversalis fascia is restored and the tissues are inverted, a convexity on the internal surface in a cone shape being produced. The approximation of the muscular aponeuroses and the abdominal wall is attained with three or four mattress-sutures in such a manner, from below upward, as to bring the external and lower structures, Poupart's ligament, fibers of external oblique, internal oblique, and transversalis muscles, over and in front of the internal and upper structures. Lay the conjoined tendon and external oblique *beneath* the cord. The first mattress-suture penetrates the conjoined tendon and the internal pillar in two places, and another turn of the needle from without inward near their lower border, and again from within outward. The two ends of the thread are now passed through Poupart's ligament and the internal pillar from within outward, about half an inch apart. The rest of the

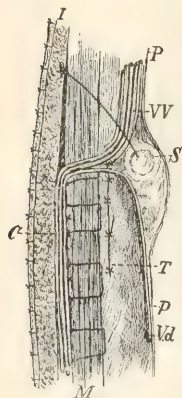


Fig. 10.—Fergusson's operation: *C*, cord in the new bed; *I*, integument and subcutaneous tissues; *M*, muscular wall sutured; *P*, peritoneum; *V*, veins excised; *S*, sac folded upon itself and showing the puckering sutures; *T*, Transversalis fascia sutured; *D*, vas deferens (Chicago Med. Recorder, April, 1893).

sutures are passed in a similar manner, remembering that all the structures, from the transversalis fascia to the subcutaneous fat, are to be included. If the conjoined tendon is thin and delicate, the border of the sheath of the rectus must be grasped by these sutures. The cord is laid on the external surface of the external oblique, and the skin sutured over it with a continuous buried suture. [Fergusson's operation promises well and should be accorded a full trial. The operations that according to records give the best results in inguinal hernia are those of Bassini and Halsted, and in femoral hernia those of Salzer, Cheyne, and Bassini. Salzer stitches Poupart's ligament to the peritoneal fascia. Cheyne ligates the neck of the sac, and by stitching the stump to Poupart's ligament and the abdominal wall fills up the canal. Two other operations may be mentioned without comment.

Thomas has advised the radical cure of hernia by decalcified bone-plates. He recommends resection of the sac, the insertion of a bone-plate (from 3 to 5 cm. wide and from 8 to 12 mm. thick) behind the pillars of the ring, the suture of the pillars over it, and the closure of the skin-wound. He claims that the bone-plate is very slowly absorbed, and is replaced by fibrous tissue.

Schwartz suggested a method of radical cure for a femoral hernia, as follows: Resect the sac, open the sheath of the adductor longus, lift up a flap 6 cm. wide, and apply this flap over the crural canal; suture above to Poupart's ligament, below to the pectineal fascia, and within to the sheaths of the vessels. Use silk. In inguinal hernia resect the sac, take a flap from 4 to 5 cm. wide from the sheath of the rectus, push its free end behind the pillars of the ring, pass sutures through Poupart's ligament below and the muscle-fibers above, uniting the flap and pillars of the canal in a solid mass. Suture the aponeurosis above the cord.]

DISEASES OF THE INTESTINES, STOMACH, ESOPHAGUS, LIVER, AND SPLEEN.

Penetrating Wounds of the Abdomen.—Chaput¹ holds that when a patient is cold and collapsed the surgeon should postpone operating, but if it is evident that the shock is due to hemorrhage, the surgeon should operate, no matter how serious the condition, unless it becomes probable that the patient would die on the table, in which case the operation ought not to be performed. When a patient with a wound from twenty-four to forty-eight hours old is found to be free from disturbance, with a customary facial expression, normal pulse and temperature, and the abdomen free from pain, expectant treatment is an absolute and binding indication, for in such case it may be assumed either that the intestine has not been involved at all, or that the wound has been rapidly closed by adhesions. Celiotomy is contraindicated when the physician in attendance is inexperienced in such work, and in the absence of proper instruments and appliances and of competent assistants, but it should be performed in every case of recent penetrating wound of the abdomen, even if it be but a punctured one. The abdominal cavity should be opened in the middle line, without any attempt to follow the course of the penetrating wound. Celiotomy should also be performed in cases in which there is a doubt as to whether the wound is a penetrating one or not, and in cases of violent abdominal contusion from an agent with a narrow surface, provided in such cases there be no general disturbance. In cases of abdominal wound that has existed for over twenty-four hours it is necessary to operate if other indications of peritonitis arise.

Inversion in Intestinal Obstruction.—Arthur Sargent² advocates the inversion of patients laboring under intestinal obstruction, this inversion

¹ Bull. et. Mem. de la Soc. de Chir., Feb., 1895.

² Brit. Med. Jour., Nov. 29, 1894.

being accompanied by taxis. The only contraindications, he maintains, are peritonitis, and great obesity accompanied by weak heart. He says a strong man should sit on the foot of the bed, take a leg of the patient over each shoulder and rise, and the surgeon should knead the abdomen with his hands.

Intussusception.—Paul¹ suggests an operation for some cases of intussus-

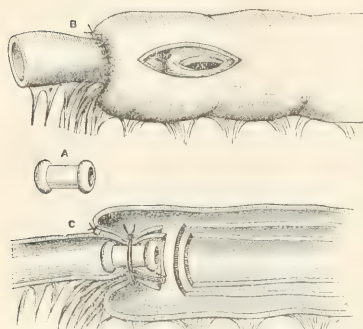


Fig. 11.—Paul's operation: A, light metal tube with expanded, rounded ends; B, incisions in the bowel, and ligature in situ; c, diagrammatic section of invaginated bowel, showing position of tube (Lancet, March 30, 1895).

ception. “There are many large vessels in the invaginated mesentery, which, being at the bottom of the wound, are difficult to get at, and cannot be readily controlled by sutures as in the slighter cases; also the tendency which the large stump of mesentery has to retract when the weight is removed is so great that the preliminary sutures are liable to tear out, thus releasing the invagination and rendering it necessary to approximate the ends by another method, or bring them out of the abdomen. I therefore propose that the surgeon should be armed with a short metal tube made of aluminium and shaped somewhat as in the engraving (Fig. 11, A). The preliminary sutures—very few of which are required—connecting the intussusceptum with the intussusciens and the first incisions are made as recommended by Mr. Barker; then the returning and entering layers are also respectively incised (see Fig. 11, B.), and the tube, grasped with forceps, is pushed into the position shown in Figure 11, c. A stout silk ligature is now made to surround the intussusceptum just above the incisions in it and is tightly tied. Finally, the intussusceptum is cut off below the ligature and withdrawn, and the wound in the outer layer is closed in the usual way.

“I have not yet had the opportunity of trying this plan, and as one may have to wait indefinitely for a suitable case I make the suggestion public, in order that if any other surgeon is so disposed he may give it a trial. The end aimed at is exactly the same as that attained by other methods; but it seems to me that there are certain advantages, of which the following, if real, are important: a saving of time, as the ligature replaces many sutures, and also closes the blood-vessels before they are divided; the operation is practically bloodless; disengagement of the invaginated stump is impossible, as it is firmly held by the ligature for at least three days.”

Artificial Anus.—Chaput² reports 35 cases, and lays down four methods

¹ Lancet, March 30, 1895.

² L'Union Médicale, No. 68.

of operating: 1. With the enterotome to destroy the spur, followed by an operation for closure of the fistula. 2. Resection with circular suture. 3. Longitudinal enterorrhaphy without resection. 4. Enteroanastomosis. He says that enterotomy is to be used in the uncomplicated case with an easily accessible opening and with a long and thin division. When the spur is long and thin he approves of Richelot's method—that is, cutting the spur between two forceps and immediate suture. In a short spur the enterotome can be used, but it must be applied several times. When the spur is very thick and hard to reach, when the wound has healed like an angular wound, and when the morbid opening is in the crural region and is joined to the bowel by a long and narrow fistula, enterotomy is not a proper procedure. Intestinal resection is contraindicated in most cases, because of the great trouble in liberating the coil of gut, because of the damaged state of the intestinal wall, and because of the almost inevitable infection of the peritoneum. When, however, in the performance of a lateral enterorrhaphy the damaged intestine is extensively torn, resection and end-to-end approximation must be practised. When enterotomy is contraindicated the proper procedure is longitudinal enterorrhaphy with resection, a circular incision being made in the skin, the fistula being opened, the two ends being drawn forward, and, after a longitudinal slit has been made in each end, the corresponding lips of the two incisions being sutured together. The orifice is then closed by sewing the freshened edges or by invagination. Enteroanastomosis is indicated when lateral enterorrhaphy is rejected because of damaged bowel or fistula in the crural region, when a narrowing exists in the lower segment at some distance from the artificial anus, and when the inferior end of the anus is obliterated.

[The following suggestion as to the treatment of fecal fistula has been made¹: In the case reported there was a fistula in the lower segment of the colon, and a cure was brought about by introducing into the lumen of the gut a rubber tube extending from six inches above the fistula almost to the anus. All fecal matter passed by the tube, and the fistula soon healed.]

Intestinal Fistula and Artificial Anus.—Senn² has contributed a masterly paper to the Chicago Gynecological Society upon this subject, his views being as follows: A fistula is an abnormal opening through which gas or a part only of the intestinal contents escape (Fig. 12). An artificial anus is an abnormal opening through which all of the intestinal contents escape (Fig. 13). The condition of artificial anus is determined by the large size of the opening or by the existence of mechanic conditions that divert the intestinal contents toward the artificial opening, these mechanic conditions being found in flexion, or the presence of a spur or septum at a point opposite to the outlet and caused by the projection of the sound intestinal wall toward the outlet. Another possible causative condition is intestinal obstruction below the opening.

¹ Berl. Dent. med. Zeit., Jan. 1, 1894.

² Amer. Jour. Obst., Sept., 1894.

Intestinal fistulæ are either intentional or accidental. The intentional are produced by the surgeon as remedial measures in various intestinal conditions. The accidental fistulæ are produced: 1. By wounds. 2. Submural injury of the intestine. 3. Ulceration of the intestine. 4. Strangulation. 5. Foreign bodies in the intestinal canal. 6. Malignant tumors. 7. Actinomycosis. 8. Abscesses of the pelvis and abdomen. 9. Appendicitis. 10. Accidental injury of the bowel during the performance of the operation. 11. Ligatures. 12. sutures. 13. Drainage-tubes. Senn insists that careless suturing in the closure of abdominal incisions is productive of infinite harm. The needle may transfix a small portion of the circumference of the small intestine against the abdominal incision, and the ligature cuts its way and causes either a fatal peritonitis or an intestinal fistula. A loop of bowel may be caught between the sutures, and abdominal strangulation result. A coil of intestine may escape between the sutures, and strangulation occur between the edges of the wound. In abdominal operations the peritoneum should always be sewed by a separate row of catgut sutures, and an attempt should be made to draw down the omentum so as to cover the entire length of the incision. The use



FIG. 12.—Intestinal fistula with flexion (Senn in *Am. Jour. Obstet.*, Sept., 1894).

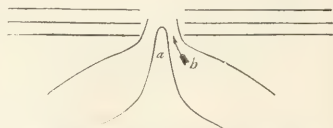


FIG. 13.—Artificial anus: *a*, spur; *b*, direction of fecal current (Senn in *Am. Jour. Obstet.*, Sept., 1894).

of pads in sewing up the omentum should be thoroughly understood and regularly practised. A tubercular abscess in communication with a tubercular ulceration of the bowel should not be incised. The proper treatment is tapping and the injection of iodoform. This retards if it does not prevent the formation of a fistula. The aim of treatment in intestinal fistula is to close the opening with the least possible interference with the lumen of the bowel. Many fistulæ close spontaneously, and this event is to be looked for when the opening is small, when the cause is benign in nature and temporary in duration, when the general health is good, and when the opening in the bowel is so situated that it can easily attach itself to the parietal layer of the peritoneum or to the serous coat of an organ. Spontaneous healing means inevitably permanent parietal or visceral adhesion, and it is only possible when the intestinal fistula is not lined with mucous membrane (Fig. 14) and when there is no spur. Spontaneous healing is impossible in fistulæ from tuberculous malignant neoplasms or in actinomycosis, and in most of these cases operative measures are strongly contraindicated, and are only to be thought of when the primary cause of the condition can be completely removed. In

some cases, however, an artificial anus can with advantage be made upon the proximal side of the accidental artificial opening. If the fistula involves the upper part of the intestine and the escape of chyle endangers life, early operation is imperatively demanded; but in other cases, when there is no positive sign that spontaneous healing is impossible, do not operate at once,



FIG. 14.—Intestinal fistula without lining of mucous membrane: *a*, abdominal wall; *b*, intestinal wall; *c*, mucous membrane; *d*, fistula (Senn in *Am. Jour. Obstet.*, Sept., 1894).

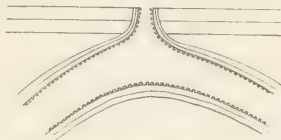


FIG. 15.—Intestinal fistula lined by the mucous membrane of the bowel (Senn in *Am. Jour. Obstet.*, Sept., 1894).

but give an opportunity for such healing to occur, carefully selecting the diet, attending to the state of the bowels, and employing rest, compression over the fistula, and antiseptic treatment of a suppurating tract. Surgical treatment includes cauterization of the fistulous tract by nitrate of silver when granulations are present (Fig. 14), by the Paquelin cautery if the channel is lined with mucous membrane (Fig. 15). Other methods include: drainage of any

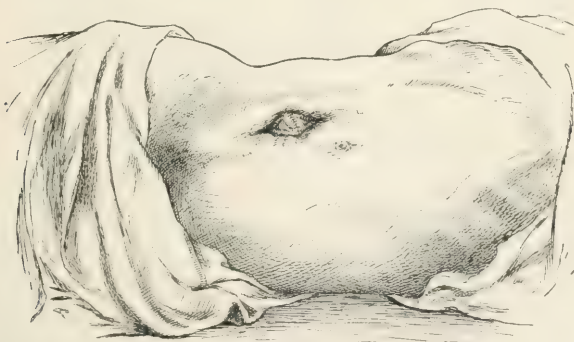


FIG. 16.—Senn's operation: provisional sutures, including all of the tunics of the bowel; transverse suturing of intestinal opening (*Am. Jour. Obstet.*, Sept., 1894).

pus-cavity; mechanical repression of a spur (of little value, because the spur is due to flexion of the bowel); removal of spur by a clamp or enterotome (often successful); plastic operation, covering the opening with a bridge of skin after the method of Dieffenbach; suturing the fistula without opening the peritoneal cavity (not very satisfactory); intestinal anastomosis when

extraperitoneal methods are inapplicable and when intraperitoneal methods are contraindicated—it can be done by decalcified bone-plates or Czerny-Lembert sutures; enterectomy (the mortality from enterectomy and circular enterorrhaphy is very great—27 to 37 per cent.; suited only for exceptional cases). Senn says that preliminary transverse suturing of the intestinal opening should always be performed, in order to prevent infection during the subsequent operation. This should invariably be done, the sutures being inserted so close together that they will prevent leakage (Fig. 16). Czerny sutures are introduced and are allowed to remain permanently, being buried later by Lembert sutures. After applying the sutures, cleanse the abdomen thoroughly before opening it, and after opening, attempt to repress the spur. This spur is due to flexion, and flexion is caused by prolapse of the intestinal loop into or even beyond the opening. The intestine should be

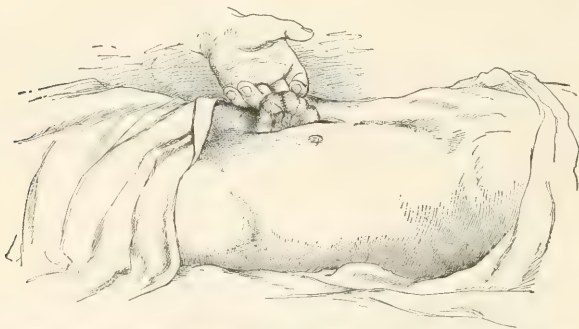


FIG. 17.—Senn's operation; intestine detached and drawn forward into wound; provisional sutures buried by a row of Lembert stitches (Am. Jour. Obstet., Sept., 1894).

attached to diminish the flexion, and recurrence is prevented by transverse suturing of the intestinal opening (Fig. 17).

Permanent Artificial Anus.—Bidwell¹ suggests the following method of making a permanent artificial anus. After its performance a bridge of normal skin will support the upper and lower openings into the sigmoid. The incision being made in the ordinary position, the peritoneum is stitched to the skin; a loop of sigmoid is brought out of the wound, and a good-sized hole scratched in its mesosigmoid. A silkworm-gut suture is passed through the whole thickness of one edge of the wound; it is then carried across the wound, through the hole in the mesosigmoid, and is finally passed through the whole thickness of the other edge of the wound. When the suture is tied, the two edges of the wound are united within the hole of the mesosigmoid. This stitch should be inserted at the junction of the middle and lower

¹ Brit. Med. Jour., April 6, 1892.

thirds of the incision. No other sutures are necessary ; but as he finds that, after the gut is divided, it is desirable to stitch the four corners of the upper portion to the skin, so as to keep the opening free, he usually passes two sutures through the skin on each side of the incision, and leaves their ends untied, so as to avoid having to give chloroform when the gut is divided. On the fourth day the bowel is completely divided on a director passed beneath it, and the sutures, previously passed through the skin, are inserted into the upper end of the gut and are tied. The stitches are removed on the eighth or ninth day.

Colostomy.—Witzel¹ advises the following method for performing colostomy : Incision is on the left side, below the umbilicus and close to the linea alba. The sigmoid is seized and drawn forward ; the upper and lower loops are sewn together and also to the peritoneum and fascia. The left rectus is split from its median edge into an anterior and a posterior part, and the skin is buttonholed ; the sigmoid is pulled through the split rectus and stitched to the buttonhole in the skin. Open with cautery on sixth day. If the rectus be atrophied, incise near the left iliac crest, draw the sigmoid out under the skin to the upper side of the left gluteal region, then open. The bowel in this situation is readily compressed by some simple appliance.

Surgery of Typhoid Ulceration.—Hare² expresses himself hopefully as to the future results of surgical interference in typhoid ulceration, and maintains that it is erroneous to assert that all or even most of the subjects of this complication are in a state of great prostration at the time of the accident. He says that in a case in which vomiting is inhibited and collapse is not marked, it is not only justifiable to operate but it is unjustifiable to refuse to do so. The line of incision should be over the spot where pain began.

Peritonitis from Perforating Typhoid Ulcer.—Abbe³ contributes a most valuable article upon this subject, and describes a case in which operation was followed by recovery. A woman, ill of typhoid for three weeks, was seized with characteristic symptoms of perforation, but as she survived the accident for two and one-half days, operation was undertaken. A median celiotomy was performed, and the lower abdomen and pelvis were found filled with a foul, purulent extravasation, two pints of which were cleared out. The abdominal cavity was irrigated with warm mercuric chlorid (1:20,000), and next with plain warm water. The perforation was discovered in the lower part of the ileum. It was a quarter of an inch in diameter, and was due to gangrene of an inflamed Peyer's patch. This perforation was closed by interrupted silk sutures overlapped by two layers of Halsted's quilted suture. The wound was not closed, but a tamponade and iodoform-gauze were inserted. At the end of forty-eight hours the dressings were changed and the bowels

¹ *Centralb. f. Chir.*, No. 40, 1894 ; *Sheffield Quar. Med. Jour.*, April, 1895.

² *Intercolon. Jour. Med. and Surg.*, Feb., 1895.

³ *Med. Rec.*, vol. 47, No. 1.

were acted upon. Slight wound-leakage occurred after the cathartic, which leakage continued for two weeks, when it ceased and the abdominal wound quickly healed by granulation. Abbe says that there have been reported 24 of these cases, with 6 recoveries, but that some of these reports are of uncertain character, and he definitely knows of 17 cases with 3 recoveries. [This is brilliant surgery. It is true that 14 cases out of 17 died, but without the operation it would seem likely that the mortality would have been 100 per cent. It will be noticed that Dr. Abbe makes a median incision without attempting to make incision at the supposed seat of perforation; that after closing with an interrupted intermittent silk suture he overlapped with two layers of Halsted's quilted sutures, the damaged condition of the bowel rendering this method necessary; furthermore, he did not close the wound, but used the tamponade and iodoform gauze.

Pearce Gould tells us that typhoid perforation is most usual in the third week, but it can occur as late as the sixty-sixth day. The symptoms may be marked or latent. Death may close the scene in ten minutes. The patient rarely survives beyond two days, and recoveries are very rare. He advocates operation. Barling, in the debate before the British Medical Association upon Gould's paper, opposed operation, as did Damer Harrison. Kendal Franks said: "Don't operate during shock, but select for operation the time between the preliminary shock and the second shock or collapse. The ulcer should be excised and a continuous Lembert suture should be inserted in the healthy tissue." O'Callaghan was so persuaded that the only hope was in operation that he advised operation entirely regardless of shock.]

Perforating Duodenal Ulcer is discussed by Marmaduke Sheild,¹ and he records two cases in which celiotomy was performed with the idea that the vermiform appendix was the site of perforation; he notices two other recorded cases to show the great difficulty that exists in diagnosis. His conclusions are: 1. That in perforative peritonitis we are not sure that the duodenum is the seat of lesion, unless it is distinctly made out that the beginning of the pain was in the epigastrium or right hypochondrium, or that epigastric symptoms, as pain and vomiting, had preceded the peritonitis. 2. That in view of the frequency of duodenal ulceration in males, the possibility of its presence should always be borne in mind when a surgeon is called to a case of perforative peritonitis in a man. 3. That the nonfeculent and occasionally acid nature of the extruded fluids and gas may serve as a valuable diagnostic aid, and that the incision should be small, an exploratory effort only, until this vital point is made clear. 4. In severe shock the surgeon should wait a few hours before operating, and when he operates he should wash the peritoneal cavity thoroughly with warm water and insert a tube into Douglas's pouch. [It will be recalled that Dean operated in a case of

¹ Int. Med. Mag., Jan., 1895.

duodenal ulcer in February, 1894, and that the patient recovered from the operation and died two months later from intestinal obstruction.]

Perforative Ulcer of the Stomach and Intestines.—Pearce Gould¹ read a striking paper before the British Medical Association upon the operative treatment of this condition, in which he opposes Billroth's suggestion of prophylactic celiotomy with excision of the ulcer and suture of the wound. He opposes it because of the great mortality, because in the majority of cases the symptoms are too slight to warrant a positive diagnosis, and because of the impossibility of localizing the exact situation of the ulcer. He tells us that 85 per cent. of gastric ulcers recover under medical treatment; that when perforation occurs into the peritoneal cavity the result is almost inevitably fatal, death occasionally being due to shock, but more often to peritonitis. A fatal result occasionally occurs at once, but acute symptoms usually last for twenty-four hours. Primary shock is to be distinguished carefully from collapse, and is to be treated by hypodermic injections of morphin and by heat. After reaction, open the belly. Do not operate in shock, but do not wait too long, or peritonitis will be marked, and lymph will conceal the parts and prevent thorough cleansing. The surgeon must thoroughly wash out the cavity. Too much stress has been laid on suture, and too little stress has been laid upon cleansing the peritoneum. The ulcer must be excised if it is possible to reach it, but if it is out of reach, suture the stomach to the abdominal wall. The best site for the incision is the middle line; the seat of pain is no guide to localization; profuse flushing should be practised with hot normal salt-solution introduced by a large tube; if hot water does not relieve the collapse, intravenous injection of normal salt-solution is to be practised; the stomach may or may not be washed out, and when in doubt, drain.

Rupture of the Intestine.—Berndt² states that after a contusion of the abdomen the following conditions indicate rupture of the intestine: The absence of liver-dulness (Moritz); frequent and uncontrollable vomiting; the appearance of peritonitis, if lesions of the kidney, bladder, liver, and spleen can be excluded; spontaneous pain in the abdomen is not of itself of much diagnostic value. Regarding the advisability of operating in these cases, the author says: 1. If there is unmistakable evidence of rupture of the intestine, immediate celiotomy is indicated. 2. Exploratory celiotomy after contusion of the abdomen is usually to be avoided; in uncertain cases, expectant treatment should be adopted (Moty). 3. If soon after the injury (twenty-four to thirty hours) there are signs of sepsis, operation is contra-indicated. A low temperature with marked constitutional symptoms is an especially unfavorable condition. 4. Rapidity and delicacy are essential in operating for rupture of the intestine, especially if peritonitis is present; therefore a long abdominal incision is requisite, and rapid, systematic exami-

¹ Med. Week., 1894, 2, No. 32.

² Deutsch. Zeitschr. f. Chir., B. 39, Heft 5 u. 6.

nation of the intestine, avoiding rough tearing or handling. If possible to avoid it, do not resect the intestine; employ simple Lembert sutures, or at most a wedge-shaped resection of the injured portion of the intestine, and close with a simple running suture including the muscular and serous coats. Flushing the abdominal cavity with antiseptic liquids is to be avoided.

Volvulus.—Roux¹ maintains that volvulus of the sigmoid flexure is due to shrinkage of the parietal attachment of the mesocolon, the shrinkage serving to bring the arms of the S nearer to each other. These arms fill with scybala, swing to and fro, and torsion finally results. He advises that the mesocolon be fixed to the abdominal wall in order to limit the movement. After the volvulus is released the entire mesocolon is fixed laterally to the parietal peritoneum by a continuous suture of catgut reaching almost to the linea alba.

Pyoktanin for Internal Carcinoma is strongly recommended by Maibaum.² He gives 6 cg. three times a day in pill form or in the form of a suppository with extract of belladonna. He claims that in carcinoma of the stomach the body-weight increases, vomiting and eructations cease, and appetite returns.

Intestinal Approximation is still the subject of discussion. Murphy³ presents an analysis of all the cases operated on with the aid of the Murphy button up to the present time. Some of the results are truly remarkable: 27 cases of gastroenterostomy for malignant disease with 9 deaths; 4 operations of pylorotomy with 1 death; 38 operations for gall-stone with 1 death (cholecystoduodenostomy); cholecystenterostomy, 8 operations with 7 deaths; resections for gangrene of the bowel with intestinal approximation, 14 cases and 1 death; fecal fistula with end-to-end approximation, 9 cases without a death; a total of 41 resections for nonmalignant disease with only 2 deaths (and if to these be added the 7 cases of Dr. Joseph Price with 6 recoveries, a total of 48 cases with 3 deaths); 4 operations of lateral approximation for malignant growths with 2 deaths; 6 for nonmalignant disease without a death; 3 resections of the rectum with recovery; and 2 lateral approximations with recovery. His conclusions are as follows:



Fig. 18.—Anas-tomosis button of Murphy.

1. The cicatrix caused by the use of the button does not contract.
2. Size No. 1, $\frac{3}{4}$ -inch (0.02 m.), or No. 2, $\frac{13}{16}$ -inch (0.022 m.), should be used for cholecystenterostomy. He prefers No. 2.
3. End-to-end, side-to-side, and end-to-side approximation of the small intestine should be made with Button No. 3, $\frac{15}{16}$ of an inch (0.025 m.) in diameter.
4. End-to-end and side-to-side approximation of the large intestine should be made with Button No. 4, 1 inch (0.026 m.) in diameter.
5. A specially large size, $1\frac{1}{4}$ -inch (0.029 m.), with a long male

¹ Centralbl. f. Chir., No. 37, 1894.

² Wiener med. Presse, xxxv., 1894.

³ Med. News, Feb. 9, 1895.

cylinder, may be used in some cases of resection of the rectum with advantage, but it should not be used unless it fits loosely. 6. In intestinal obstruction, resection with end-to-end union gives better results than lateral approximation, and when practicable should always be performed. The same operation should always be done in gangrenous hernia. In fecal fistula the bowel should be resected and united end-to-end. 7. The patients should receive liquid nourishment as soon as the effect of the anesthetic passes off. The bowels should be made to move as soon as possible after the operation, and frequent evacuations should be kept up. 8. If the button does not pass in three or four weeks, the rectum should be examined, as the button may rest just inside the sphincter. 9. There has been one case reported of occlusion of the button by fecal impaction in the cylinder. This can easily be avoided by a mild cathartic immediately after the operation. 10. When returning the intestines to the abdomen they should be placed in parallel lines, especially at the seat of approximation, to prevent sharp curves and obstruction. This occurred once with the button; many cases are reported following suture. 11. There is no danger of obstruction from the button, as not a single case has been reported. This proves that the deductions made by Chaput of Paris from experiments on the cadaver are erroneous. 12. There is no danger of extension of the pressure-atrophy beyond the line of pressure. 13. Primary adhesion may be hastened in malignant cases by abrading the peritoneum with a needle. It is unnecessary in nonmalignant cases. 14. A supporting suture is never necessary to secure union, and should only be used to relieve tension when the viscera approximated are forced out of position. 15. The mucous membrane should be pushed down in the cup of the button before closing it; if redundant, it should be trimmed off with the scissors. It should never be allowed to protrude between the edges of the button when the button is closed. 16. While the button is easily inserted, the pathologic condition requiring the operation may demand the greatest surgical skill to secure a favorable result. 17. If the button appears at the opening of the fistula after lateral approximation, do not try to force it through the opening; this is unsurgical. Open the abdomen, and (*a*) press the button back to the anastomotic opening and through it on down the intestine, and it will pass; or (*b*) make a longitudinal incision in the bowel and take out the button. [The question of intestinal approximation is still by no means settled. There can be no possible question that the use of Dr. Murphy's button in many cases has certain noteworthy advantages. Dr. Murphy¹ himself claims that in intestinal approximation, the more rapidly the operation is performed the less the danger of shock; the less we manipulate and expose the intestine the less will be the danger of infection or postoperative paralysis; the more uniform and continuous the pressure at the seat of approximation the greater the assurance of adhesion; mechanic means have produced better

¹ Chicago Medical Review, June, 1894.

results than the suture in both lateral and end-to-end approximation; the mortality in end-to-end approximation is less than in lateral apposition; the more perfect the juxtaposition of various layers the less cicatricial contraction and the more complete the regeneration across the line of union; the more extensive the approximation surface the larger the fibrous deposit and the greater the contraction; the contraction with end-to-end is less than with lateral approximation; the juxtaposition of the similar histologic layers of the wall of the intestine is an assurance against cicatricial contraction. He states that the *modus operandi* of the button is based upon the following principles:

1. It retains apposition automatically and without suture.
2. Union of tissue is produced at the line of pressure-atrophy.
3. The pressure-atrophy is pro-

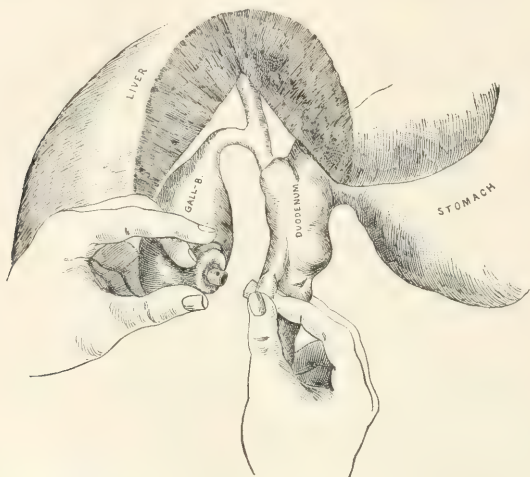


Fig. 19.—Showing method of holding parts while approximating button in cholecystenterostomy (Chicago Medical Review, June, 1894).

duced by elastic pressure. 4. It produces juxtaposition of the ends of the same coats. 5. The union is accomplished by the smallest possible cicatrix, and is therefore limited by the least amount of contraction. 6. The rapidity of application gives all the advantage that saving the time can accomplish. Figs. 19, 20, and 21 show the application of the button in cholecystenterostomy, the introduction of the sutures in lateral approximation, and button in end of bowel.]

Mr. Treves of London says that better results have been obtained with Murphy's button than with any other appliance.

[In spite of the obvious advantages of Dr. Murphy's button, and in spite of the very favorable nature of the statistics which he presents, the profes-

sion has by no means universally adopted it, except in certain varieties of cases. So distinguished an authority as Senn considers that the button gives entirely too small an opening. Chaput claims that the button is likely to be arrested, and in one case which he cites the lumen was blocked with feces, but Murphy shows how easily this complication can be avoided. Vansardale had a case in which the button fell back into the stomach after a gastroenterostomy. Welmann of Vienna has abandoned the button, because he thinks it is not secure.

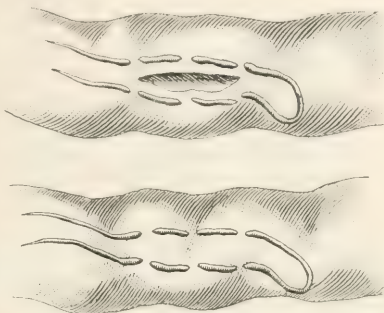


Fig. 20.—Showing method of introducing sutures in lateral approximation, and relative size of incision (Chicago Medical Review, June, 1894).

König says he never yet lost a case from shock, and hence will not abandon older methods for Murphy's. He fears the apparent simplicity of

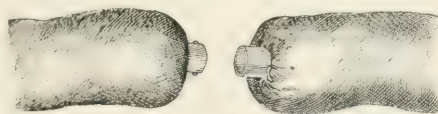


Fig. 21.—Button in end of bowel ready for closing (Chicago Medical Review, June, 1894).

button-operations will give much perilous surgery to incompetent hands. This argument of König would prevent all simplification of technic. We think it only just to state that many of the ill results claimed as resulting from the use of Murphy's button have been due to a failure to accurately follow the inventor's rules for its application and his suggestions as to subsequent treatment. He holds that liquid food should be given as soon as the effect of the anesthetic passes off; that a movement of the bowels should be obtained as soon as possible after the operation, and frequent evacuation should be maintained; that the mucous membrane should never be allowed to protrude between the edges of the button; that a supporting suture is not needed unless there is great traction. Murphy states that no case is on record of obstruction from the button. Many of the leading surgeons, nevertheless, agree with Dr. Senn when he says, "We have reason to believe that the technic of intestinal suturing remains an unfinished chapter, and that the ideal method of uniting intestinal wounds has to be devised," and with Dr. Abbe, when he expresses a desire to secure more rapid and certain procedure,

free from the embarrassment of mechanical support. The search is for some nonmechanical means of operation.

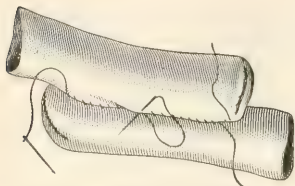


Fig. 22.—Abbe's anastomosis without rings.

The operation of Abbe, without rings, gives very excellent results (Fig. 22), secures a large opening, and maintains apposition, but a person who performs it within a reasonable time must be a surgeon who constantly performs intestinal operations. It is not an operation for a novice, but this is no real objection. There can be no question,

it seems, that in cholecystenterostomy, at least, the Murphy button is superior to any method yet suggested. The button most certainly greatly economizes time in the end-to-end operation, unless the surgeon is especially expert in applying intestinal sutures.]

DISEASES OF THE LIVER.

Constrictions of the Liver.—Bastianelli¹ discusses those cases in which portions of the liver, having been constricted from the general body of the organ and remaining attached by a pedicle, give rise to movable tumors in the abdomen. He records such a case in a woman thirty-seven years of age who had had five children. On the right side was a tumor the shape of the kidney, but much larger, hard, somewhat nodulated, and very movable. The tumor altered somewhat in size at times and scarcely moved with respiration. No connection with the liver could be made out. Percussion was dull over the tumor, but resonant all around. The diagnosis was made of a displaced carcinomatous kidney, and celiotomy was performed. The tumor was at once discovered, covered with grayish-white nodules and without adhesions, and was felt to be connected with the right lobe of the liver by a band of liver-tissue; on its under surface lay the gall-bladder. The tumor was removed and with it the gall-bladder. The patient made an uninterrupted recovery. The piece of liver removed weighed 500 grams. The author concludes that floating liver-lobes may be due to malformation, deformation, or the traction of new growths. The symptoms are not characteristic, and the cases are likely to be confounded with floating kidney.

Wound of the Portal Vein.—Lepine² discusses the question, "Is a wound of the portal vein of necessity fatal?" and he does not hesitate to affirm that a wound of this vein, either of the main trunk or of one of its branches, is of necessity fatal, unless it is a slight puncture. In cases of puncture, Lepine discusses the question of whether lateral ligature is possible. This operation, he says, does not seem practicable upon either of the two branches, and the procedure is absolutely impossible when the wound of

¹ Il Policlinico, April, 1895.

² Lyon médical, July 1, 1894.

the vein is not on the free border of the vessel, but is upon the portion deeply sunk into the liver. He says, "Suppose a large wound of one of the terminal branches, which is visible." It is improper to tie the vessel above and below the wound; this double ligature would certainly arrest the bleeding, but would inevitably bring about an interruption of the circulation in one of the liver-lobes, and this circulatory interruption would suppress the function of a large portion of this organ. It would also produce difficulty of circulation in the portal vein, which would eventuate in increase in the size of the spleen and in great congestion of the intestinal mucous membrane. In case of ligation of the portal vein, death occurs in part because of congestion in the splenic and mesenteric veins. An operation to meet this objection has been proposed by a Russian surgeon named Eck. Lepine has performed it upon dogs for the purpose of suppressing the physiologic function of the liver. His method is as follows: Make an incision through the linea alba and stand to the left of the patient; by drawing the intestines out and to the left, expose the inferior cava; tie the cava between the inlet of the renal veins and the junction of the common iliaes, at a point where the renal veins empty; clamp the cava, and cut the vessel between the clamp and the ligature. The portal vein should be tied as near as possible to the hilum of the liver. Clamp the vessel a few centimeters below the site of ligature, cut the vein near the ligature, insert the lower end of the divided vessel through a sort of ferrule which is shaped like a napkin-ring, and fold it back over the ferrule so that the lining membrane of the vein becomes the outer layer over the ferrule. After the vein is thus arranged, tie it and pass it into the upper end of the vena cava and fasten it, so that nothing now remains to be done but to remove the two clamps and cause the blood of the portal vein to flow into the vena cava.

[It is remarkable how much the liver will tolerate. Tricomi reports a case in which it was found necessary to extirpate the left lobe of the liver. An attempt had been made to remove a liver-tumor the size of a fist by constricting the base with an elastic ligature. This attempt was a failure, and cure was also sought by the wire ligature and by the thermocautery unsuccessfully. The growth was cut away, bleeding was arrested by the thermocautery and iron solution, the wound entirely healed, and the patient made a good recovery. Valerian von Meister has proved that the liver has marvelous powers of regeneration, and that in rabbits, cats, and dogs even three-fourths of the organ can be reproduced in from forty-five to sixty-five days. This regeneration is brought about chiefly by hypertrophy of the lobules.]

Punctured Wounds of the Liver.—Romme¹ discusses the subject of punctured wounds of the liver, using as a special text the case of President Carnot. He says that in the 543 cases of traumatic diseases of the liver which Edler collected, 65 were caused by cutting or sharp-pointed

¹ La Tribune médicale, July 5, 1894.

instruments. Of this group, 23 recovered and 42 died. The chief causes of death were hemorrhage and peritonitis. In the majority of cases shock of great severity was present. Pain was not an invariable symptom, and jaundice was not a constant sequel. Bilious vomiting was extremely frequent, as were cough and dyspnea. The principal symptoms, traumatic shock, collapse, local and radiating pains, nausea, vomiting, and respiratory disturbances, were all present in the case of President Carnot. From an experience gained in the case of the President, the author strongly recommends early exploratory celiotomy in all penetrating wounds of the liver.

Rupture of the Liver.—Zeidler,¹ in setting forth the subject of wounds of the liver, states that the diagnosis of liver-ruptures is not easy; such symptoms as local pain, radiating pain, jaundice, enlarged and tender liver, arise late, and yet the danger is in the early period—that is, in the first twenty-four hours in most cases. He says that external local measures can never arrest the hemorrhage, and that when, as is not unusual, it is found impossible to diagnosticate injury of the liver, exploratory celiotomy is indicated if there is any possibility of this condition existing. He describes 3 cases of wounds of the liver in which recovery ensued. The hemorrhage from the liver was arrested in one case by the tampon and in the other two by the Paquelin cautery. He says that there

is very little tendency to the spontaneous arrest of liver-hemorrhage and that the best means for arresting it are found in suture of the liver, the cautery, and the tampon. The cautery can hardly be employed to arrest hemorrhage from large vessels in the depths of the liver, and in such situations sutures should be used. The fact that the blood-pressure in the liver-vessels is low permits us certainly to arrest hemorrhage by means of the tampon.

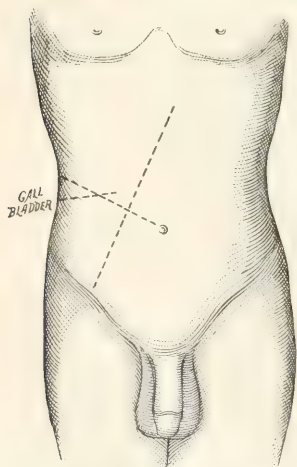


Fig. 23.—Normal situation of the gall-bladder in males (Jour. Am. Med. Assoc., April 3, 1895).

The Normal Situation of the Gall-bladder in Males is studied out by Hamilton.² He gives the following rule to find the gall-bladder: Draw a line from the anterior superior spine of the right ilium to the center of the xiphoid appendix. Intersect this with a line from the umbilicus to the tenth costocartilaginous junction.

In the right upper triangle, near the apex but nearer the inner right oblique line, the fundus of the gall-bladder will be found, and a

¹ Deutsche med. Woch., Sept. 13, 1894. ² Jour. Am. Med. Assoc., April 3, 1895.

needle thrust through the abdomen at this point will transfix the gall-bladder. It is to be remembered that the position of the gall-bladder varies with the changes in the position of the liver, and in some cases it is deflected to the right.

Perforation of the Gall-bladder.—Williams and Sheild¹ set forth a remarkable case of perforation of the gall-bladder following typhoid fever, that was successfully treated by abdominal section. They tell us that a suppurative cholecystitis is rare apart from calculi, but can occur from typhoid fever. Gilbert and Griade of Paris reported a case in which the pus from the gall-bladder contained typhoid bacilli. Gilbert produced the disease in rabbits by introducing typhoid bacilli into the common duct.

Colorless Fluid in the Gall-bladder.—Richardson² speaks of the limpid, colorless fluid so often found in the gall-bladder in operations for biliary calculi. He says whether this fluid is decolorized bile or simply the accumulation of mucous-membrane secretion, he cannot say, but in view of the fact that in most cases of obstruction with jaundice the bile is thick and dark in color, it would appear that such fluid must indicate a complete and prolonged closing off of the gall-bladder from the biliary vessels. The existence of this symptom is a very clear indication that there is complete obstruction in the cystic duct; but an obstruction in the cystic duct does not necessarily prove that there is not also obstruction in the common duct. He says that the many deplorable results in gall-bladder surgery are due to delay in operation. Early operation is comparatively safe, and it is futile in cases of persistent and repeated biliary obstruction to attempt the removal of gall-stones by medical means.

Surgery of the Gall-bladder and Bile-ducts.—Robson³ summarizes his views, drawn from an experience of 78 cases. He gives the following indications for operation: 1. Frequently-recurring biliary colic without jaundice, whether the gall-bladder is enlarged or not. 2. Persisting jaundice ushered in by pain. 3. Empyema of the gall-bladder. 4. Peritonitis arising in the region of the liver. 5. Purulent collections about the gall-bladder. The difficult diagnostic operations of sounding for gall-stones and aspiration of the distended gall-bladder he thinks dangerous and futile, and he prefers a small exploratory incision, when treatment can be carried out as required. Cholecystenterostomy is usually the operation to be preferred in the treatment of affections of the gall-bladder or bile-ducts, especially in calculi, but it is often impossible to say what operation is demanded until the abdomen is opened.

Impaction of Cystic Duct.—Hans Kehr⁴ advises incision of the cystic duct in all cases of impaction. He makes a four-inch incision through the right rectus muscle, inserts his right hand into the abdomen, and separates

¹ Lancet, March 2, 1895.

² Med. Rec., Nov. 3, 1894.

³ Brit. Med. Jour., April 28, 1894.

⁴ Berl. klin. Wochenschr., June 4 and 11, 1894.

gently all the adhesions until the hand reaches the cystic duct. He then feels for and finds the stone, and endeavors to force it back into the gall-bladder. Following the method of Lauenstein, standing at the patient's right side, the surgeon turns his back to the patient's face, and, bending forward, inserts the left hand into the abdominal opening, and tries to force the stone from its impacted position. If this maneuver fails, the gall-bladder is aspirated, flat sponges being packed around it to catch any bile. The bladder is opened, the wound-edges held apart by forceps, and the cavity of the bladder cleaned with bits of gauze. The right hand holding the stone, the left index finger is passed into the bladder, and by manipulation an endeavor is made to move the stone backward. A sound or a pair of forceps may also be tried. If these plans fail, the bladder is stitched to the wound, and further manipulation abandoned until swelling of the mucous membrane forces the stone into view, when it can be readily removed. Kehr says if a very large stone is found, or a strongly impacted calculus, proceed at once to incise the cystic duct over the point of impaction, remove the stone, sew up the incision with fine silk, and insert drainage.

Irrigation of the Biliary Ducts after Cholecystotomy.—Baudouin¹ sets forth his views on irrigation of the biliary ducts after cholecystotomy, in order to remove remaining calculi. He says that the subject has recently been brought into prominence by Fontau of Toulouse. Fontau proposed to irrigate the gall-bladder and ducts with sulphuric ether in order to dissolve any residual calculi; the same idea was brought into practice in 1892 by Mayo Robson, who used a solution of ether and turpentine. Baudouin says that the good effects of such injections are due not to the composition of the injection, but to the fact that the gall-bladder is opened, allowing escape for its contents and diminution of inflammatory obstruction of the ducts. He shows that a long time is requisite for the solution of these calculi, even if surrounded by ether, or ether and turpentine, and that in the cases discussed the fluid must have evaporated or passed into the duodenum before it could have exerted any decided effect. Kehr of Halberstadt employs irrigation with hot water, oil, or glycerol, for the purpose of mechanically expelling the stone. Baudouin would limit the injections to those employed solely for the purpose of diminishing the congestion and inflammation of the ducts. We might use a one-half per cent. solution of zinc chlorid, but Baudouin believes that such injections should be practised with solutions of boric acid, of potassium permanganate, or of simple sterilized water; and as he has no hope of removing the obstruction by the mechanic force of the injection, he advises against the employment of any kind of syringe, preferring instead a simple siphon-apparatus.

¹ *Progrès médicale*, No. 35, 1894.

DISEASES OF THE ESOPHAGUS AND STOMACH.

Foreign Body in the Esophagus.—Gandolphe¹ reports a case of foreign body in the thoracic portion of the esophagus, for which external esophagotomy was performed. The operation was successful. The patient was a lunatic, aged forty-seven, who had swallowed a pebble, and neither solids nor fluids could pass the obstruction. On the fourth day esophagotomy was performed, the incision being made on the left side of the neck at the anterior border of the sternocleidomastoid muscle. The left lobe of the thyroid gland was found somewhat enlarged, and it was pushed aside, and the inferior thyroid artery was divided between ligatures. The esophagus was recognized back of the trachea, being of a grayish-white color, and the foreign body was easily felt behind the sternal notch. The esophagus was opened just above the obstruction, and the pebble seized with forceps and removed. No sutures were inserted in the esophagus, but a stomach-tube was passed through the wound, and iodoform-gauze was packed around it to make it tight. The patient was fed through this tube three times a day. Some weeks subsequently the tube was removed, and the patient was fed through a nasal tube for another fortnight, when the man was allowed to swallow naturally. Twenty months later deglutition was perfectly normal. The author expresses his great surprise that in cases treated by this method subsequent stricture seems to be extremely rare, for in 142 cases, of which 110 recovered, no mention whatever is made of this sequel. He says that the enlargement of the thyroid body is a constant feature in these cases, but it disappears after operation. He discusses the different situations in which foreign bodies are likely to be arrested, and lays down the treatment appropriate for each. Taking the observations of Gaillard and Richardson, he shows that the average distance from the teeth to the cardiac orifice of the stomach is nearly 37 cm. in females, of which 18.5 cm. is extrathoracic; while in males the distance is about 40 cm., 20 cm. being suprasternal. The indications for treatment of foreign bodies in the cervical portions of the esophagus are well known, but very little has been set forth concerning those found lower down. Gandolphe gives a resume of the thesis written by Gaillard. The facts given were based on 26 cases subjected to esophagotomy, with but 4 deaths. In 2 cases the impaction occurred within 30 cm. of the teeth, and under these circumstances esophagotomy should always be attempted if the foreign body is giving rise to any unpleasant symptoms, though it may remain perfectly harmless and quiescent, and then should be left alone. The extraction is rendered easier by the fact that the esophagus is very movable in the vertical direction, the surgeon being able to pull it upward. If the impaction is further than 30 cm. from the teeth, gastrotomy is the best treatment, the hand being inserted, if necessary, into the stomach,

¹ Lyon médical, Jan. 20, 1895.

and the cardiac orifice dilated so as to remove the foreign body from below, which procedure may be rendered easier by passing an esophageal sound by the mouth.

Stricture of the Esophagus.—Mayo¹ sets forth the record of a child three years of age laboring under a stricture of the esophagus. After the performance of a gastrotomy the cardiac orifice of the stomach was sought with the little finger, but this caused so much gastric disturbance and leakage that it was determined to wait. A month later esophagotomy was performed low down. A probe was passed by way of the stomach through the obstruction and out the wound of the neck. A heavy double strand of braided silk was fastened to the probe and drawn through the channel. Another strand of silk was used to cut the tissues by the ingenious string-saw method of Abbe of New York, while the second strand was used to keep the stricture tense. This stricture was cut and the opening greatly enlarged. During the succeeding month, at intervals of a few days, this process of division was carried on, and perforated shot clamped on the thread were drawn through to aid dilatation. Bougies were afterward passed, and the fistula in the neck was allowed to cicatrize.

Recent Methods of Gastrotomy for Stricture of the Esophagus.—Willy Meyer, in an extremely interesting paper² on this subject, speaks of the old method of Fenger as a plan that continued in use for forty years, but owing to its usual ill-success, so far as functional result was concerned, has been practically abandoned. He describes the method of Von Hacker, in which the operator makes a fistula through the left rectus muscle so as to secure a sort of sphincter action through the tonic contraction of its fibers around the extruded portion of the stomach-wall. He says that Von Hacker's method is unquestionably a useful one; that if it is properly carried out leakage rarely sets in, but if it does set in, the tube must be exchanged for one of larger size. If the largest tube in the market has been put in, and yet regurgitation occurs at times, the tube should be removed during sleep and replaced on the following day. He takes up the method of Hahn, which was first employed in 1877. In this method Fenger's transverse incision is made; the peritoneal cavity is opened in the same line; the parietal peritoneum is punctured at this point; the opening being enlarged by forceps; a fold of stomach is drawn through the space with a dressing-forceps, and fastened by stitches between the two cartilages. The method of Witzel, which was first published in 1891, he considers an extremely valuable one. In this method the fistula passes through both the rectus and transversalis muscles, the fibers of which run at right angles to each other, and may be expected to contract more efficiently than will the rectus alone. The second important feature of Witzel's operation is the infolding of the tube in the wall of the stomach, with stitching of the stomach-wall over the tube so as to form an

¹ N. Y. Med. Jour., p. 433, 1894.

² Am. Jour. Med. Sci., Oct., 1894.

oblique cone. Mikulicz advises that the patient be kept flat on his back for a few days after the operation, but Meyer believes this to be a mistake, and prefers to let a patient sit up at once in order to prevent pulmonary complications. He thinks Witzel's method is a most excellent one, the best known, that it is simple and moderately rapid, and that it prevents leakage and depressing sequelæ with certainty even when the tube is removed. The infolding of the tube renders the entrance of the latter into the stomach oblique. Figures 24, 25 illustrate Witzel's method of securing the tube.

The Ssabanejew-Frank method was originally called Frank's method (Fig. 26), and in this operation a cone of the stomach is drawn up through

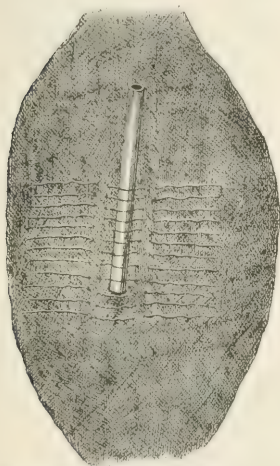


Fig. 24.—Witzel's method for gastrostomy, showing application of sutures in wall of stomach, imbedding tube obliquely therein (*Annals of Surgery*).

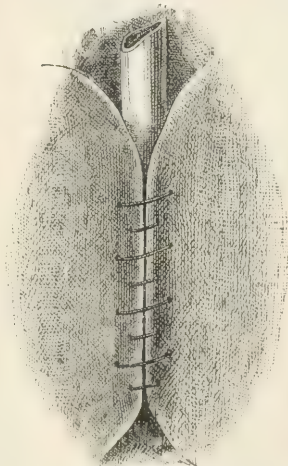


Fig. 25.—Sutures tied, completely imbedding tube for some distance (*Annals of Surgery*).

Fenger's incision and under a bridge of skin to a point above the border of the ribs, where it is fixed and opened. The fistulous canal passes through the abdominal wall in a curved direction beneath a bridge of stretched skin.

In 1887, Maydl proposed, in cases in which acid or caustic lye had been swallowed, to perform a gastrostomy at a very early period, so that food would not pass over the esophageal ulcers, and, as a consequence, irritation would be avoided. Fluids can be swallowed without harm, as they help to wash off the surface. Even if this is done, cicatricial tissue will form and will also tend to contract, and a stricture will form if the parts are left alone, but by the passage of sounds from below and above, narrow, twisted, and impermeable stricture can be avoided.

Willy Meyer concludes that there are three useful and reliable methods of gastrostomy; that of these, Witzel's absolutely prevents leakage; the Ssabanejew-Frank operation promises the same result if properly performed, and the patient who has submitted to gastrostomy need not starve because of regurgitation of food along the tube. He says that in view of

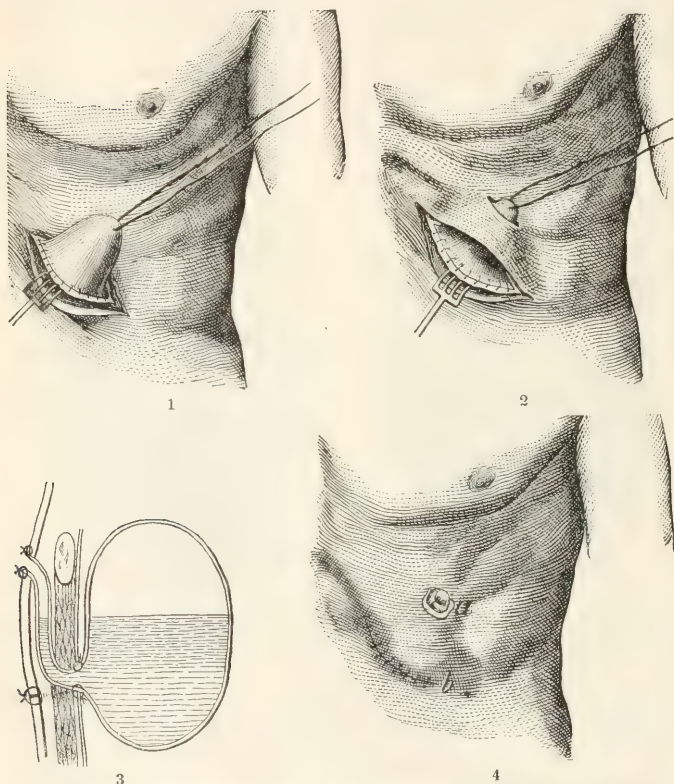


Fig. 26.—Frank's method of gastrostomy in carcinoma of the esophagus (Wiener klin. Woch., 1893, No. 13).

this fact gastrostomy should be resorted to early in cases that will sooner or later need this operation, and that in burns of the esophagus, primary gastrostomy and early dilatation of the contracting scar will probably prevent conditions which, if allowed to progress, will become incurable. In carcinoma of the esophagus a gastric fistula should be made as soon as the

patient shows a steady decrease in weight. Further experience is needed with reference to the Ssabanejew-Frank method before an attempt is made to give each of the three operations its proper place. Von Hacker's method is only used for far-gone cases, and, if the patient is very weak, can be done under cocain anesthesia in two sittings. [Thomas S. K. Morton has recorded a case of operation by the Ssabanejew-Frank method upon a man fifty-one years of age, for the relief of carcinomatous stricture of the esophagus, in which the results were extremely gratifying. The operation presented no difficulty. The patient could have been nourished from the beginning through the new opening, but this was deferred for twenty-four hours; the valve formed by the fistulous tract crossing the edge of the orifice acted perfectly, and there was at no time leakage of any consequence. The patient suffered from a violent cough most of the time after operation, but even with this complication leakage never occurred beyond a drop or so during the paroxysms. At the end of two weeks the man returned to his home and fed himself regularly. He had no hunger, was perfectly comfortable, gained much in weight, and returned to his occupation, which was that of a tailor. He lived in great ease for six months after the operation, and then expired suddenly from an esophageal hemorrhage. Morton considers this method to be the most convenient and useful, and thinks it the best of the modern methods of gastrostomy for carcinomatous disease.]

The Surgical Treatment of Diseases of the Stomach.—Rosenheim¹ says that in operations for carcinoma no absolute cure is on record, but judgment should be suspended until sufficient experience is obtained. Favorable results have been obtained, and there is no doubt that life has been prolonged and suffering greatly lessened. The surgical treatment of carcinoma of the stomach really resolves itself into the treatment of carcinoma of the pylorus and its neighborhood. It consists in resection with removal of the diseased material, or in gastroenterostomy. According to Guinard, the mortality in 153 resections was 62 per cent. The mortality, according to the same authority, in gastroenterostomy was 31 per cent., although Rockwitz gives it at as low a figure as 12.5 per cent. Contraindications to resection of the pylorus are: Extension of the growth over half of the stomach; extensive adhesion to the liver and pancreas; implication of the mesentery; infiltration of the lymph-glands; and metastases. Much depends upon early diagnosis, but early diagnosis is often impossible without exploratory incision. When operation cannot be performed, the condition can be palliated by washing out the stomach regularly. In benign tumors of the pylorus the result is frequently good. We may practise resection, gastroenterostomy, pyloroplasty, or Loreta's operation. Pyloroplasty should only be used in cases of stricture from cauterization, and cases of unhealed ulcer are not suitable for this proceeding, as bleeding is liable to ensue; furthermore, pyloroplasty is

¹ Berl. klin. Wochenschr., Feb. 25, 1895.

inapplicable to a case where there are extensive adhesions on the posterior wall. In idiopathic dilatation of the stomach, if no result comes in several weeks from washing out the organ, operation is desirable. It is wrong to wait until the patient is exhausted. Gastroenterostomy is indicated if the malnutrition advances. In the operative treatment of ulcers three events are to be borne in mind—bleeding, perforative peritonitis, and perigastritis. In the event of bleeding, indications for success are not good, but when life is threatened an operation must be attempted. Only 1 recovered of 15 cases of perforative peritonitis operated upon. Perigastritis after perforation may be treated by operation. In advanced carcinoma of the cardiac end of the stomach, operation has done but little good, and should only be undertaken when fluids are blocked as well as solids. When the stricture is simple, gastrostomy should be performed, and the stricture dilated through the pathway of the stomach.

Dilatation of the Stomach.—Löwenstein¹ considers the most common cause of dilatation of the stomach to be stenosis of the pylorus. He says there are two methods of surgical treatment, that dealing with the obstruction only (gastroenterostomy), and that by removal of the obstruction and at the same time diminishing the size of the enlarged organ by a partial gastrectomy. Out of 18 cases of gastroenterostomy collected there were 6 deaths; in 22 cases of resection of the pylorus there were 7 deaths.

Brandt² has devised an operation for dilatation of the stomach which he names *gastrorapie*, or “stomach-reefing.” He endeavors to diminish the size of the stomach by folding in its wall and suturing it through the serous and muscular coats. The fold is first made in the anterior wall, and two rows of transverse sutures are applied, and the same procedure is carried out on the posterior wall through holes which are torn in the great omentum. More than 200 sutures are applied.

Gastrorrhaphy.—Gilford³ reports a successful case of *gastrorrhaphy* for perforated ulcer of the bowel. The patient was a woman twenty-nine years of age, who had shown symptoms of gastric ulcer for eight years. One morning after breakfast she was seized with fearful pain in the neighborhood of the umbilicus; the respiration was thoracic and much restricted; the abdominal muscles were tense and sensitive to pressure. There was nausea at first, but no vomiting. The temperature was subnormal, and a diagnosis was made of perforation of a gastric ulcer. *Celiotomy* was performed in the middle line, and the small perforation was found on the anterior wall of the stomach. The interior of the stomach was explored for other ulcers, but none were detected. The margins of the perforations were excised, and the opening was closed with silkworm-gut sutures.

Extirpation of the Stomach.—*La Tribune médicale* for Jan. 16, 1895,

¹ Münch. med. Wochenschr., May 22, 1894.

² Med. Rec., Dec. 8, 1894.

³ Lancet, No. 3692, p. 1369.

gives an outline of Langenbuch's contribution upon total extirpation of the stomach. Three patients were treated, of whom 2 died. In the first case, on opening the abdominal cavity, the stomach was found very much contracted, and it presented extensive carcinomatous infiltration on its posterior surface. Section was made at the pylorus and the cardiac extremities, after division of the epiploon, and the portions removed represented seven-eighths of the stomach. The pylorus was stitched to the remains of the cardiac orifice, making a cavity about the size of a hen's egg. In this case a cure was accomplished in three weeks. The second case was that of a man in whom almost the entire stomach was removed, and the pyloric and cardiac ends were stitched together in the wound at the parietes. The third case was that of a man, sixty-two years old, with a carcinoma of the pylorus. After pylorotomy the line of suture was confined with iodoform-gauze packing. Unfortunately, the patient suffered from bronchitis, and coughing caused the sutures to give way, and the patient died on the twenty-third day, of inanition. [These very extensive operations, without a hope of cure or a prospect of amelioration, seem to us entirely unjustifiable.]

Perforated Gastric Ulcer.—Kirkpatrick¹ reports a case of perforated gastric ulcer in which celiotomy was performed. The lesion was found in the anterior wall of the stomach, a little to the right of the esophagus. The opening was closed with a continuous Czerny-Lembert suture, after trimming the ragged edges with a pair of scissors. A drainage-tube was inserted, and the patient made an uninterrupted recovery. A notable feature was the pain in the abdomen and shoulders that followed the perforation.

Morse² reports a case of ruptured gastric ulcer, which was treated successfully by abdominal section and sutures. The patient was a young woman twenty years of age. After the commencement of the symptoms of perforation, five hours elapsed before the performance of celiotomy. When the abdomen was opened the contents of the stomach were discovered in the peritoneal cavity. The perforation was found on the anterior surface, close to the cardiac orifice. The stomach was washed out and the perforation closed with Lembert's suture, and the peritoneal cavity was washed out and the wound united. Food by the mouth was withheld for sixty hours, and at the end of three weeks the patient was cured.

In the discussion Mr. Barwell said that he had collected 25 cases in all, and had since heard of 4 others. One of the cases must be excluded, as it was really a case of localized abscess that was opened and drained. The operation should be performed as soon as possible after the occurrence of the injury. The front wall of the stomach should be thoroughly searched, for, though ulcers are most common behind, perforation is rarer on the posterior wall than on the anterior. The usual sequence of ulceration on the posterior wall was a gradual perforation with the formation of an abscess.

¹ Montreal Med. Jour., March, 1895.

² Lancet, March 17, 1894.

If an operation were performed later, the best guide to the rupture would be the point of most marked peritonitis and effusion of lymph. In 4 cases the site of the rupture could not be found because it was covered with the exudation. If the perforation could not otherwise be found, the patient might be made to drink methylene-blue solution, in order that by leakage the place of rupture could be indicated. It is not necessary to cut the ulcers away; they heal just as well if tucked in. The washing out of the stomach through the place of rupture is of great advantage, and the peritoneum should be thoroughly irrigated with warm boiled water. [The perforation can be found by the insufflation of hydrogen gas.] Mr. Howard called attention to the fact that though the symptoms of perforation were usually well marked, the diagnosis was not always easily made. The symptoms of pleurisy or pleural pneumonia may occur, and a careful exploration of the pleura ought to be undertaken. Mr. Page referred to some cases of interest. In his first case the operation was performed forty hours after perforation, and the opening was found firmly closed. In the second case the operation was performed eighteen hours after the perforation, and he opened the abdomen over the site of the initial pain. The ulcer was close to the cardiac end of the stomach, and so far from the surface that it was impossible to close it. In the third case it was decided to defer operation, as there were indications that the peritonitis was only local. After four days a drainage-tube was inserted into the cavity, which contained pus and gastric contents. The necessity of operating in the perforation of gastric ulcer seems to be imperative, but the operation should be done early, before sepsis has arisen. The stomach should be pulled out through the wound, so that it can be washed, examined, and sewed up with ease, and the peritoneal cavity must be washed out with the greatest possible care. Mr. Morse in his case did not wash out the peritoneum by merely passing the tube to the various regions of the abdomen, allowing the return water to wash out the fragments, but he passed two large tubes side by side to every part of the cavity, and continued to flush out each spot until the remaining fluid was perfectly clear. He thus was able to wash out the extravasated stomach-contents through the tube, instead of driving them from one part of the abdomen to another.

Technic of Operations on the Stomach.—Kocher¹ gives the technic and results of certain operations upon the stomach. In performing gastro-enterostomy he advises incision in the median line, drawing upward of the omentum until the intestine is exposed and a loop of intestine can be drawn out. This loop of intestine is examined to find the beginning of the jejunum, and when the desired point is found it is attached to the stomach along its transverse axis, so that the upper end ascends and the lower end of the intestine descends. This favors the flow of the gastric contents into the distal portions of the intestine. The intestine is opened transversely for almost

¹ Correspondenzblatt f. Schweiz. Aerzte, Nos. 21 and 22, 1893.

half of its circumference, and is then sutured to the stomach so that the proximal portion of the intestine is close to the stomach and the distal end is free above the other portion. Thus, when the distal end becomes distended it will compress the proximal end against the stomach, but the reverse condition cannot occur. A sort of valve is made by incising the intestine convexly with the convexity downward, and by uniting the outside surface of this valve to the lower wound-margin of the stomach, the rim of the valve remaining free. A line of sutures is next passed through the

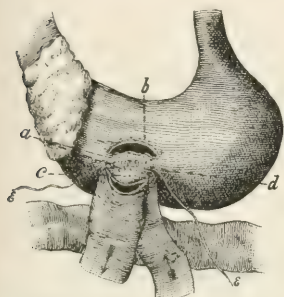


Fig. 27.—Kocher's method of gastroenterostomy: *a*, places of the posterior annular suture through the entire wall of the stomach and intestine; *b*, places of the anterior annular suture through the entire wall; *c*, valve at the jejunum by arch-formed incision; *d*, posterior annular suture of the serosa; *e*, thread-ends for continuing anterior suture of the serosa (Correspondenzblatt f. Schweiz. Aerzte, Nos. 21 and 22, 1893).

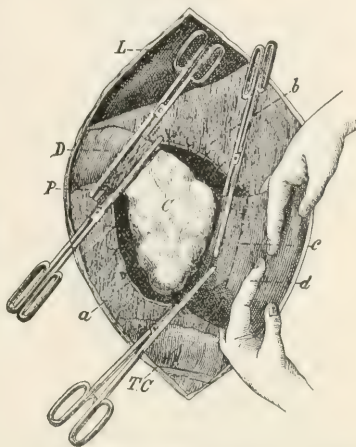


Fig. 28.—Kocher's method of pylorectomy: *L*, liver; *D*, duodenum; *P*, pylorus; *C*, carcinoma; *T.C.*, transverse colon; *a*, separation-place of the ligature gastocolicum; *b*, separation-place of the lesser omentum; *c*, separation-line of the stomach; *d*, place where the stomach is kept closed by the middle and index fingers (Correspondenzblatt f. Schweiz. Aerzte, Nos. 21 and 22, 1893).

serous coats of both the intestine and stomach, and a continuous posterior suture is made through the entire thickness of the stomach-wall. Finally an annular anterior suture through the serous coat is applied. His method for resecting the pylorus, which he has performed 9 times, with 7 recoveries, is described as follows: ¹

"Incision as before; the tumor is pulled out as much as possible and its limits fully established. The omentum is detached from both the stomach and intestine, and every bleeding point is controlled at once, while the larger vessels are avoided if possible. The whole region is then thoroughly surrounded by sterilized gauze. One clamp is now applied close to the limits of the new growth on the side of the duodenum, and two are applied on the stomach side, one above, the other below. A second clamp is then applied

¹ Am. and Surg. Bull., July 1, 1894.

to the duodenum, parallel and quite close to the first clamp, and the intestine is severed between them (Fig. 28). The portion of the cut end of the intestine which hangs free beyond the clamp is then thoroughly disinfected, while the end toward the tumor is wrapped in sterile gauze, and the whole tumor-mass is lifted, while the duodenum is placed across the right margin of the wound and covered with moist gauze (Fig. 29). An assistant now seizes

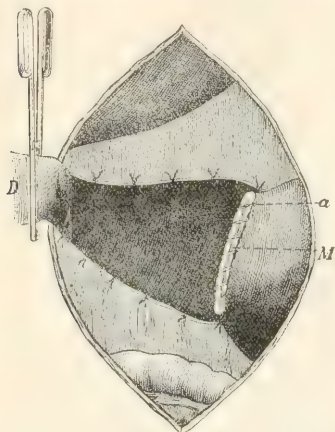


Fig. 29.—Kocher's method of pyloroplasty: *D*, duodenum turned out; *M*, mucous membrane of the stump of the stomach; *a*, first continuous suture through the entire thickness of the stomach-walls (Correspondenzblatt f. Schweiz. Aerzte, Nos. 21 and 22, 1893).

the stomach between the middle and index fingers of both hands so as to close it completely, and the hands and stomach are all surrounded by sterilized gauze. The stomach is then cut through along the line of the two clamps, and the tumor is removed. The gastric contents that escape are then cleared away, bleeding vessels secured, and the stomach sutured by means of a continuous silk suture, which includes all the layers of the gastric wall. The suture-line is carefully washed with mercuric-chlorid solution, and then a continuous Lembert suture is passed, closing the peritoneal surfaces carefully. The compresses should then be changed, and the assistant then seizes the stomach with both hands, turning the pos-

terior wall forward and to the right, and pressing it against the right wound-margin so as to occlude the duodenum. With the forceps still closing the duodenum, its posterior wall is attached to the posterior stomach-wall, a continuous peritoneal suture being applied from the upper to the lower margin (Fig. 30). The forceps on the duodenum are then removed, the escaping intestinal contents are wiped away, and the end of the duodenum is carefully cleansed. Hemorrhage must be arrested by ligature. An incision $\frac{1}{2}$ – $\frac{3}{4}$ cm. from the line of gastroduodenal suture is made in the gastric wall. The length of the incision is governed by the diameter of the intestine. Hemorrhage is then controlled, and a line of sutures is applied, including either all the coats of both stomach and intestine, or only the peritoneal and muscular coats, or simply the mucous coat. A second line of continuous peritoneal sutures is then applied all around the point of attachment. The operative field is then carefully washed off again with mercuric-chlorid solution, and the gauze is removed, the parts replaced, and the abdominal wall closed.

A Method of Gastrostomy is recommended by Edmund Andrews and

E. Wyllys Andrews¹, in which a valve is formed of mucous membrane. After the stomach is opened the cavity is washed out with boric-acid solution, the lower part of the anterior wall is raised and brought out through the incision and spread out flat, and from the lower end of the incision two cuts are made through the loose mucous membrane, one to the right and the other to the left, each extending about three-quarters of an inch laterally from the lower end of the main incision. A species of shutter is made of mucous membrane on each side. The tube is laid in this, and these flaps, or shutters, are closed over the tube with stitches of the mucous membrane, and stitches are then applied to the outside of the primary stomach-incision.

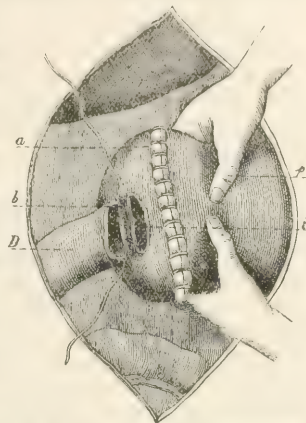


Fig. 30.—Kocher's method of pylorotomy: *D*, duodenum at the posterior wall; *a*, continuous suture of the peritoneum; *b*, posterior line of peritoneal continuous suture of the ring; *p*, assistant's thumb pressing the stomach against the duodenum so as to close its lumen; *i*, incision in the posterior gastric wall (Correspondenzblatt f. Schweiz. Aerzte. Nos. 21 and 22, 1883).

Surgery of the Spleen.—The Providence Medical Journal of July 2, 1894, reviews the remarks upon splenectomy made by Terrier at a meeting of the Paris Society of Chirurgy. Terrier says that when dislocation of the spleen takes place certain complications may supervene, such as peritoneal trouble, or only pain. The peritoneal trouble can arise from twisting of the pedicle, which is similar to the twisting that occurs in ovarian cyst. He has found records of 3 such cases, besides the one reported by Hartman. In some instances torsion of the pedicle merely causes pain without peritonitis. Cases of this character have been those on record. Sometimes torsion of the pedicle produces no symptoms. Klein reports the case of an aged female in which the autopsy revealed the pedicle completely twisted, but the lesion did not give rise to the slightest discomfort.

Conklin² reports a successful case of splenectomy for malarial spleen. He says that the hemorrhage was slight and readily controlled, but the shock was profound and entirely out of proportion to the amount of blood lost. In reviewing the subject of splenectomy he says that the record of the past decade in the operations for simple hypertrophy, including malaria, shows 20 recoveries and 8 deaths. In over 50 per cent. of cases of floating or displaced spleen it is specifically stated that the spleen was enlarged, while in very few is it designated as normal in size. Extirpation in cases of floating or displaced spleen is attended with brilliant results. Splenectomy for trauma

¹ Jour. Am. Med. Assoc., May 19, 1894.

² Med. Rec., July 28, 1894.

has a better record than for disease, though the graver injuries included under the head of traumatic rupture have necessarily a high mortality. Hemorrhage and shock constitute the chief dangers in splenectomy, about 70 per cent. of the deaths being attributed to these accidents. The hemorrhagic diathesis, according to Mosler, is frequently associated with enlarged spleens, both simple and leukemic; it is often latent and will probably be unsuspected before operation is begun. The most common source of bleeding is the pedicle. Some surgeons advise the ligation of the vessels of the pedicle, in addition to the ordinary encircling ligature, but Treves says no advantage attends this procedure. The shock, which is so profound, is not easily explained. Traction upon the pedicle in manipulating the tumor has often brought on dangerous collapse, probably because of pressure upon the splenic nerve-plexus. It is not improbable that many deaths credited to postoperative collapse are really the result of a slow intraabdominal hemorrhage. He summarizes the position of splenectomy as follows: It is justifiable in leukocythemia, or in conditions when there is extensive involvement of lymphatic glands, or a notable increase in the white blood-corpuscles. It is indicated in tumors, simple hypertrophies, and other splenic enlargements attended with danger, and that have proved incurable under medical treatment. If movable spleens demand operation, extirpation is to be preferred to fixation. Severe traumatism of the spleen, with or without an external wound, or simple prolapse of the gland into a parietal wound, demand immediate extirpation. In cases of protrusion experience shows that excision, either partial or total, is safer than replacement. Removal of the spleen for cystic disease has a good record, but trial should first be made of incision with drainage. In abscess, incision and drainage is, as a rule, preferable to removal.

Tricomi¹ reports 8 cases in which he had extirpated the spleen for various morbid conditions, with a fortunate issue in all but one. He ligated the splenic artery in 1 case. In 2 of the operations median celiotomy was performed; in the others a curvilinear incision was made from the lower border of the seventh rib of the left side to the anterior superior iliac spine. In one case of splenic leukemia, in which the proportion of white blood cells was 1 to 70 of red, the splenic artery was ligated, and in this case the spleen became slowly gangrenous, and death took place on the forty-fifth day. Zuccarelli² reports two cases of splenectomy for malarial spleens, in which both cases recovered early from the operation. He makes the interesting note that in the second case there was a positive enlargement of the thyroid gland on the sixth or seventh day after the operation. Furthermore, that in the first case two months after operation the left leg became edematous, with marked enlargement and induration of the lymph-glands in the groin, the involvement of the lymphatics being most marked on the left

¹ *Le Mercredi Médical*, 1894.

² *Am. Med. and Surg. Bull.*, May 1, 1894.

side, although those on the right side were somewhat affected. He gives a table of the splenectomies performed in Italy: 9 cases of movable spleen with 2 deaths; 8 cases of simple hypertrophy with 3 deaths; 12 cases for malarial spleen with 3 deaths; 4 cases for leukemia and pseudoleukemia with 2 deaths.

[It was proved by Tizzoni, in his experiments upon rabbits, and by Credé, in his experiments upon dogs, that an individual could live without a spleen, but these observations were only confirmatory of what was long ago known, because Pean, in 1867, successfully removed a spleen from a woman twenty years of age. At the present time the spleen is occasionally removed for hypertrophy, simple or malarial, because it is floating, for abscess, for malignant disease, for cystic conditions, and for injuries. For leukemia the operation has been attempted with an extremely high record of mortality. As a matter of fact, most authorities oppose the removal of the spleen in leukemia.]

Tubercular Peritonitis was discussed by Carl Beck in the Eleventh International Medical Congress.¹ He advocated the introduction of 1:10 mixture of iodoform and glycerol into the abdominal cavity even in cases of doubtful diagnosis and also in general peritonitis. Ever since Spencer Wells² opened an abdomen in tubercular peritonitis, and after simple exposure to the air for a short time obtained a cure, it has been known that exposure to the air for a short time may cure this condition. In view of this well-known fact Duran³ has adopted the following plan in tubercular peritonitis accompanied with ascites: He evacuated the fluid with a trocar and insufflated as much air as possible through the same trocar, the air having been passed through caustic potash wet with phenic acid. The air was permitted to remain in the peritoneal cavity for a few minutes and was then let out, after which a compress was applied. Tympanites persisted for about eight days and then began slowly to subside. A new method of treating tubercular peritonitis is set forth by Nolen-Leiden,⁴ who states that the contact of air with the peritoneal surface of the intestines effects the cure. He punctures with a small trocar, allows a small portion of fluid to escape and forces air into the cavity by a syringe, the air being sterilized by passing through sterilized cotton and warmed by bubbling through warm water. This procedure is of great advantage in children. It is stated that Guignabert,⁵ following the method set forth by Rendu, advocates intraperitoneal injection of camphorated naphthol in the treatment of tubercular peritonitis.

At the Congress of the American Obstetrical and Gynecological Association, held at Toronto,⁶ Morris of New York gave the results of some experiments he had made, with a view of determining the reason of the cure

¹ *Therap. Gaz.*, June 5, 1895.

² *La Médecine Moderne*, March 3, 1894.

³ *Revista de Ciencias Medicas de Barcelona*.

⁴ *St. Louis Med. and Surg. Jour.*, 1894.

⁵ *Rev. Obstet. et Gynecolog.*, July, 1894.

⁶ *Med. News*, Oct. 13, 1894.

of tuberculosis of the peritoneum after operation, it being well known that 80 per cent. of these cases recover after simple exposure of the peritoneum to the air. He collected fluid from the abdominal cavity of patients with tubercular peritonitis, and kept it in an incubator for forty-eight hours, and developed the bacteria of putrefaction which would ordinarily enter into such fluid exposed to the air. From this fluid he then isolated a toxalbumin, the product of the growth of putrefactive bacteria. When this toxalbumin was added in moderate amounts to cultures of tubercle bacilli in tubes, it very promptly destroyed the organisms. He therefore concludes that tubercular peritonitis recovers after operation because putrefactive bacteria produce a toxalbumin in the fluid that is fatal to tubercle bacilli. The reason why it is more effective in curing tuberculosis of the peritoneum than tuberculosis of a joint, is because the anatomy of this tissue is such that any poisonous agent absorbed by the lymphatics of the peritoneum is brought into close contact with the entire structure; whereas in the joint the lymphatics are fewer and more definitely in channels.

Peritonitis.—Among the most important articles of the year are the Lettsomian Lectures for 1894, delivered by Mr. Treves,¹ of the London Hospital, who states that many symptoms are to be considered as but the attempts of the organism to rid itself of some trouble, and the symptoms are in many cases curative acts, and considering the symptoms of peritonitis from this standpoint, the indicated treatment will be rest, the relief of pain, starvation, and intestinal evacuation. In regard to the peritoneum, he states that its surface is very extensive, as great probably as the area of the whole body-integument; that it possesses wonderful powers of absorption; offers a limited resistance to microorganisms and their products; provides highly-favorable conditions for healing; is more vulnerable in some portions than in others; and possesses a great sensitiveness, a fact of much moment in the production of shock. The following classification of peritonitis is suggested as advisable from his personal knowledge of the subject: 1. Peritonitis due to infection from the intestines. 2. Peritonitis due to infection from without. 3. Peritonitis due to infection from the pneumococcus. 4. Tubercular peritonitis. 5. Peritonitis of doubtful nature, such cases of peritonitis, for instance, as are (*a*) due to irritants, (*b*) dependent upon rheumatism, gonorrhea, syphilis, Bright's disease, and alcoholism, and (*c*) peritonitis in the newly born. In considering in detail the treatment of peritonitis, he advises absolute rest in the recumbent position with the knees flexed over the belly to diminish abdominal tension, the upper part of the chest and the arms being protected from cold by a wool-jacket, and no attempt being made to restrain the patient in his tendency to hold the arms above the head. To restrain will produce restlessness and discomfort. The old rule in regard to feeding is a sound rule, that is, give as little food as possible by the mouth.

¹ The Practitioner, London, June, 1894.

In this matter of feeding, avoid the extremes, avoid the absolute prohibition of any kind of food whatever by the mouth, and avoid the intemperate use of ice and of iced fluids. It is true that thirst is a most torturing symptom, which is not always entirely relieved by rectal injections. The patient is fiercely anxious for water. The administration of water will probably produce vomiting, but the patient will not die of vomiting, and would rather vomit than suffer from thirst. Very often relief is afforded by giving a fairly copious draught of water, which, though it is rejected by the stomach, washes out that viscus and leaves the patient more comfortable, but the perpetual sucking of ice is extremely bad and should be abandoned. If there is great thirst, let him have a very little ice or a little iced milk and soda water, or if, as is not unusual, he has an inclination for something warm, let him take a few spoonfuls of hot water or hot weak tea or of hot beef tea, not for the purpose of nourishment, but to give fluid to the stomach. The old rule in regard to opium is the best, *i.e.*, give as little as possible. In the early stages of acute peritonitis, and especially in perforative peritonitis and those cases dependent upon appendicular troubles, hypodermic injections of morphin are absolutely necessary and may avert death from shock, but morphin should never be given in peritonitis as routine treatment. It obscures the symptoms and retards the natural process of cure. In general septic peritonitis but very little morphin is called for and often none at all. Aperients have a distinct and valued place in the treatment of peritonitis in the earliest stages and in some cases throughout the whole attack, but when once general peritonitis has established itself an aperient is without avail. Blood-letting has been relegated too far into obscurity. It has a distinct and valuable place in localized peritonitis, and in perityphlitis the application of half a dozen leeches often acts magically. Operative measures consist in drainage with or without irrigation. Treves divides peritonitis into two classes when considering operative measures, one in which there is vigorous well-defined inflammation with local symptoms, pus being produced; clearly localized operation upon this first class is exactly comparable to opening an abscess. In the other class the peritonitis is diffuse and constitutional symptoms are far more prominent than are local signs. The changes in the serous membrane are comparatively slight,—in the second series of cases the cutting into the abdomen and the subsequent flushing and drainage are comparable to the washing out of the stomach after the swallowing of an active poison. The operative treatment of suppurative peritonitis with local effusion has been employed successfully, but the operative treatment of generally diffused nontubercular peritonitis has been phenomenally unsuccessful. Surgical treatment has been most unsuccessful in acute peritonitis succeeding gangrenous hernia and puerperal infection, and has been but little more successful in cases of perforation in which the inflammation was well established. Treves discusses at considerable length and with great thoroughness of detail the

best methods of operative technic, the advantages and disadvantages of irrigation, and the necessity of and the methods of applying drainage. He says that drainage is necessary when either a naturally poisonous material is left in the peritoneal cavity or when it can be predicted that an extensive effusion is bound to follow upon the celiotomy. Some cases may be drained by means of a stout rubber drainage-tube, others by strips of iodoform-gauze as used first by Bardenheuer. The great objection to an iodoform-gauze drain is that it may produce poisoning, is difficult to remove, and is likely to leave ventral hernia as a legacy. In conclusion, Mr. Treves says that it only remains to state that the surgical treatment of peritonitis has not yet attained either a satisfactory or a secure position.

Is the Apposition of Peritoneum to Peritoneum a Surgical Error? is the title of a paper by J. Grieg Smith,¹ who says that some years ago various accidental experiences unsettled his belief in the old axiom that the surgical rule should be, peritoneum to peritoneum. That during the past two years he has deliberately and intentionally acted as if the axiom were an error, and the result of his experience has convinced him, that in all cases in which sound, rapid, and permanent union is desired, the apposition of peritoneum to peritoneum is a mistake. His first doubt as to this apposition arose in connection with intestinal operations, and particularly with the means of providing intestinal drainage in cases of obstruction. In some of these cases he dared to suture parietal peritoneum to bowel, and both to skin, often, indeed, omitting to place sutures of any kind; but the cavity was shut off just as well when the bowel was implanted on the raw surface as when it was implanted on peritoneum. Later on, when he came to the closure of a fistula or artificial anus, he found this direct implantation of the bowel into the incision could be a disadvantage, because the adhesions were likely to become so firm and extensive that it was not easy to separate them. He now lays down this rule: When he wants temporary drainage with loose adhesion and mobile bowel, as in a temporary enterostomy, he sutures parietal peritoneum, bowel, and skin; but when he desires firm and intimate adhesions that are to be permanent, as in celiocolostomy, he implants bowel directly upon raw surface, and he may increase this raw surface by unfolding or peeling from the abdominal parietes more peritoneum and turning its raw surface on to the bowel. He states that raw surface to raw surface is better than serous surface to serous, but is not quite so good as raw to serous.

DISEASES OF THE MUSCLES AND TENDONS.

Tendons.—Phelps,² in considering some cases of contracted tendons resulting from infantile paralysis, recommends division of the tendons instead of attempts at stretching these structures. Doyon³ gives the results of

¹ Brit. Med. Jour., Jan. 5, 1895.

² N. Y. Med. Jour., Feb. 24, 1894.

³ Provincial Med. Jour., No. 14, 1894.

previous experiments as to the contractures of tetanus. He wished to determine whether the cause could be a reflex one, and whether the reflex curve involved the sensory or the motor tract. The experiments were made upon dogs, and he first investigated the contractures in the neighborhood of the point of primary contraction. The reaction following the irritation of mixed nerves in relation to arterial pressure was the same on both sides. He concludes as the result of his experiments that the ptomain of tetanus acts exclusively upon the sensory nerves, thus explaining why it is that even the slightest of peripheral irritants produce widespread and violent contractions.

Wretland¹ has been making some special studies upon the psoas muscle, and finds that this structure may frequently be involved in an inflammatory condition. These lesions support the theory that persistent abdominal pains, which are aggravated by exercise, and which are limited to the lower portions of the abdominal cavity, may be caused by a chronic inflammation of the psoas muscle due to rheumatism, or to injury. This condition may produce an irritation of the bowels or the nerves of the bowels. Massage, baths, etc., comprise the best methods of treatment.

The Operative Treatment of Wry-neck is considered by Mikulicz,² who was not satisfied with the results either of subcutaneous or open division of the sternocleidomastoid, and advises almost entire removal of the contracted muscle, the only portion which is left being the posterior part of its upper extremity, in the region of the spinal accessory nerve. He has performed this operation 17 times with success. In only one case has there been much disfigurement of the neck due to the absence of the muscle. Examination of a portion of muscle removed has rendered him certain that wry-neck is the result of a chronic inflammation or a fibrous myositis, which involves the whole of the muscle. This condition in congenital cases, he thinks, is due rather to compression of the muscle during a prolonged labor, than to laceration. The so-called hematoma of the sternomastoid, which is not unusual in infants, is not caused by the effusion of blood, but is produced by the thickening and induration of inflamed muscle.

DISEASES OF THE RESPIRATORY ORGANS.

Tracheotomy.—Gayton³ presents a study of the tracheotomies as performed in the Northwestern Hospital at Haverstock Hill. The cases number 161; of these 132 were of diphtheria, 15 of scarlet fever complicated with diphtheria, 12 of scarlet fever with laryngeal affections, and 2 of croup associated with measles. A large proportion of the patients were admitted in a very critical condition and the operation was needed at once, while some patients were positively moribund, requiring artificial respiration and hypodermic injections immediately the cannula was introduced. The symptoms

¹ N. Y. Polyclinic, Aug. 15, 1894.

² Centralbl. f. Chirur., No. 1, 1895.

³ Lancet, Aug. 11, 1894.

that were considered to indicate the necessity for operation, were loud stridor, sucking in of the intercostal spaces and bending in of costal cartilages, urgent dyspnea, and cyanosis. There was nothing very especial in the details of the operation, excepting the fact that after incising the skin the trachea was exposed by clearing the soft parts by means of the dissecting forceps. This step makes the operation simple, safe, prompt, and also abolishes hemorrhage. Following Mr. Parker's suggestion, the trachea and the larynx were cleared of membrane by free feathering up and down, and the extraction, if possible, of membrane by the forceps. Chloroform was always given even when cyanosis was present. The after-treatment consisted in covering the wound with a sponge saturated with a solution of mercuric chlorid and the maintenance of a warm, moist atmosphere by means of the tent and steam kettle. Mercuric chlorid was freely sprayed over and around the wound every two hours. If the parts became dry with collection of scanty mucus, difficult to expel, a solution of soda was applied by the atomizer through a cannula and into the trachea. Patients were fed on raw meat juice or chicken broth, and iron was given them. The deaths were as follows: 64 from extension and bronchopneumonia, 16 from cardiac failure, 9 from the severity of the disease, 3 from scarlet fever, 1 from paralysis of the respiratory muscles, 1 from hemorrhage, 1 from surgical emphysema, 1 from septicemia, and 1 from pertussis. The largest number of deaths occurred before the end of the third day. Twelve cases died between the seventh and fourteenth days, 3 cases lived fifteen days and one sixteen days after the operation. The removal of the tube was attempted as early as possible. The use of the tube as a rule was finally abandoned between the fifth and tenth days, but in one case it was necessary to retain it twenty-three days. Gayton concludes that there are some few who even now maintain that tracheotomy is useless in diphtheria, recognizing the disease as purely constitutional with a local manifestation. It must, however, be acknowledged that in some cases there is a tendency to death by extension of the membrane from the fauces through the glottis into the trachea, ultimately producing obstruction, that is, that though death may tend to occur by rapid failure of the vital powers, it may also tend to arise from suffocation, the strength being fairly maintained. These latter cases, in spite of science and the presence of much membrane in the fauces and elsewhere and the existence of albumin in the urine, not infrequently recover after operation, and many lives may be saved by an early resort to tracheotomy. He says that the general death-rate from diphtheria in the fever hospitals of London range from 39 to 27 per cent., but that since a greater reliance has been placed upon operative treatment the death-rate from diphtheria in this hospital has been reduced from 31.42 per cent. to 26.48 per cent. [There is much unnecessary fear of hemorrhage in this operation. The distended veins shrink greatly in size the moment air is admitted to the lungs. If it be found difficult to push aside the veins and the case is urgent, put the

patient in the Trendelenburg position, open the windpipe, and then clamp and tie the veins.]

Empyema is discussed by Sunderland,¹ who says the abscess is opened after resecting a rib and the pleural cavity is explored with the finger, washed out, and a drainage-tube inserted. The drainage-tube should be just long enough to enter the pleural cavity. A long tube will produce pleural irritation. The site of incision is not determined by any consideration of dependent position and drainage, as the emptying of the abscess-cavity is due not to the gravity but to the expulsion of the fluid by pulmonary expansion and pushing up of the diaphragm. When the seropurulent discharge markedly diminishes, the drainage-tube should be removed and the wound in the chest permitted to heal. The removal is generally effected on the third day after operation. So soon as the chest-wound heals, artificial respiration by Sylvester's method should be employed two or three times a day, in order to secure expansion of the lung and prevent reaccumulation of the fluid. Exercises should be employed to expand the chest, and continue for months until the two sides become equal and symmetrical.

Delorme² describes an operation which he prefers to Estlander's in the treatment of chronic empyema. He exposes the pleural cavity by a large flap in the chest-wall. The skin-flap reaches from the third to the sixth rib, and the bones and intercostal muscles are sectioned in correspondence with the skin-flap and are turned back. Through this large opening the lung may be explored and stripped of its pyogenic membrane. The flap is now turned down again into place and sutured. Complete union invariably occurs. Schutz,³ after reporting 18 cases of empyema in children treated by resection of one or more ribs, concludes that the prognosis of the operation in early childhood is not good, but that siphonage cannot be employed on account of the liability of the tube to slip out, and the operation, in spite of its danger, must be practised because the mortality under expectant treatment has been as high as 80 per cent. Dubief and Bolognesi⁴ advocate injections of salt water into the pleural cavity for the cure of empyema. In the case cited pleurotomy was performed, the pleural cavity was rapidly washed with salt solution, and a complete cure was effected in two months. The salt solution employed was as follows: 20 g. of sodium chlorid, 1 of sodium sulphate, and a liter of distilled water.

White,⁵ and Alfred Wood, in an article on the treatment of empyema, say that whenever pus in the pleural cavity has been detected, the use of drugs is not to be considered at all except in so far as is rendered necessary by the general condition of the patient. They then mass the different plans of operating as they have been classified by Steele: 1. Aspiration. 2. Aspi-

¹ *Lancet* Jan. 27, 1894.

² *Gaz. des Hôpitaux*, No. 2, 1894.

³ *Therap. Monatshfte*, J. 8, H. 2, 1894.

⁴ *Bull. Gen. de Therap.*, Aug. 30, 1894.

⁵ *Therapeutic Gazette*, No. 8, 1894.

ration and antiseptic irrigation. 3. Thoracentesis with trocar and cannula. 4. Thoracentesis, with subsequent drainage. 5. Simple incision. 6. Incision and drainage. 7. Incision with through-and-through drainage. 8. Subperiosteal resection of a rib and drainage. 9. Thoracoplasty (Estlander's operation). 10. Perflation. If pleural effusion is recognized as of recent formation, and if the patient's strength is good, aspiration with aseptic precautions may be performed, but if the effusion is of long standing and the patient's condition is hectic, free drainage must at once be instituted. If the needles used in surgical aspiration are surgically clean there need be no apprehension that on account of the puncture any fluid that reaccumulates will assume a more unfavorable character. If the fluid returns after aspiration a more radical operation must be undertaken. When the chest contains pus we may lay it down as a general rule that nothing short of thoracotomy will suffice to cure. No attempt need be made in this operation to prevent the entrance of air into the chest. Because of the difficulty in securing free drainage by simple incision, costal resection is often necessary. This allows very free drainage and intrathoracic exploration, and adds practically nothing to the dangers of a simple thoracotomy. Ashhurst in a paper on Surgical Treatment of Empyema, read before the American Surgical Association May 29, 1894,¹ maintains that no operation is justifiable in which the presence of pus is uncertain, unless thorough treatment by medicinal agents, blisters, etc., has failed, or unless the symptoms, dyspnea, etc., are so urgent as to demand immediate relief. He takes this view in the first place because of the difficulty in diagnosis. He considers that it is often impossible to be absolutely certain whether pus is present or not. He objects to operation except under these circumstances, in the second place, because even with our improved methods of tapping there is risk of converting a serous into a purulent effusion. His next proposition is that the first operation should always consist of simple aspiration with antiseptic precautions. His reason for this is that in case a mistaken diagnosis has been made there is less risk from the aspirating needle than from a free incision into the pleural cavity. His third proposition is that when the fluid has partially accumulated, incision and drainage should be practised. If the fluid is simply serous there will probably be no accumulation after aspiration. If the fluid is purulent it will almost invariably re-form. In this latter case he thinks that incision and drainage should be resorted to. He says: "I believe, in the fourth place, that drainage should be effected by making two openings, one at the lowest available point, and carrying a large drainage-tube through the cavity from one opening to the other." His fifth proposition is that drainage should be supplemented by washing out the cavity with mild antiseptic fluids. He prefers a mild boric acid solution. As the lung begins to expand he shortens the tube. His sixth proposition is that when the lung is so bound down by

¹ Med. Press and Circular, Aug. 8, 1894.

adhesions that it cannot expand, resection of one or more ribs should be practised in order to permit collapse of the chest-wall and to promote healing by bringing the costal and visceral layers of the pleura into contact. The prognosis of Estlander's operation is on the whole favorable, the unfavorable cases being those usually in which there is general tuberculosis.

THE RECTUM AND ANUS.

The Rectal Tube.—Cripps¹ discusses the subject of the dangers of the long rectal tube. He says that, in spite of the condemnation of the rectal tube by eminent authorities, he usually finds in most cases of obstruction that the tube has been introduced. He says the common idea, that these tubes may usually be pressed into or beyond the sigmoid flexure, is a delusion. As a means of diagnosis or treatment of stricture beyond the reach of the finger, tubes are absolutely useless. If a stricture is present, it is 100 to 1 against the tube or bougie entering it at all, for it would almost certainly be caught in the cul-de-sac caused by invagination of the stricture; if a stricture is not present, the arrest of the bougie by the sacral promontory gives a delusive diagnosis. A stiff tube may place a patient's life in imminent peril; a soft tube is apt to curl up and do no hurt.

Anal Fistula.—Goelet² describes an operation for fistula in ano in which he secures primary union and complete retentive power of the sphincter, even if it has to be cut in two places. He obtains this result by carefully uniting the raw surfaces by means of sutures, introducing first buried catgut continuous sutures for the deeper structures, including the muscles, and separate interrupted sutures of chromic gut for the mucous membrane and perineum. [Dr. Frederick Lange was the first to suggest excision of the fistula and approximation of the raw surface with sutures.]

Rectal Incontinence.—Gerster³ advises that in the treatment of rectal incontinence we should apply the principles set forth by Gersuny upon the incontinence of urine in women, and just as he cured this urinary incontinence by torsion of the urethra, so can we cure rectal incontinence by torsion of the rectum. Two or three inches of the lower portion of the rectum should be freely dissected out, and the gut should then be twisted in an arc of 360°, and secured to the skin by a dozen sutures. This will cure both prolapse and incontinence.

Prolapse of the Rectum.—Bryant⁴ advocates physiologic rest in the treatment of prolapse of the rectum and reports the case of a man who was operated on seven times unsuccessfully for the relief of extensive prolapse of the anus, with its attendant distressing symptoms. Bryant made an artificial anus in the left groin and put the patient to bed for two weeks, and this operation was followed by relief of all the symptoms. He concludes that in certain

¹ Boston Med. and Surg. Jour., Sept. 13, 1894.

² Am. Surg. Bull., July, 1894.

³ Med. Rec., vol. xlv., No. 6.

⁴ Mathew's Med. Quarterly, vol. i., No. 4.

cases of rectal prolapse the formation of an artificial anus is justifiable both as a palliative and curative measure.

Resection of the Rectum.—A new method of resecting the rectum, devised by Moulouguet,¹ was set forth by Routier before the Chirurgical Society of Paris. The first step is the same as in Kraske's operation. The sphincter is then dissected out and the lower part of the rectum, whether healthy or unhealthy, is cut away. The sphincter after having been dissected out is lined by the upper portion of the rectum, which is pulled down for this purpose, and is sutured to the edges of the wound in the anus. The perineo-sacral wound is then sewed up, with a drain in the lower portion. The usefulness of this operation is restricted to those cases in which the carcinoma is not high up and in which the sphincter is intact.

Hemorrhoids.—Manley² describes a bloodless method for treating hemorrhoids, each hemorrhoid being seized close to its base between the tips of the thumb, index, and middle fingers. It is put upon the stretch and twisted, and finally so completely crushed that it is pulpified, and none of the investing tunics remain except the mucous membrane and its under stratum of fibrous tissue. He has treated 32 cases successfully by this method. Bishop³ sets forth a bloodless method for the excision of hemorrhoids, claiming the best of results from this plan. He clamps the base of the hemorrhoids with forceps so as to make the approximated surfaces parallel and free from folds, and then applies on either side a sufficient length of tubing and secures it with aseptic catgut after the usual manner of quilled suture. All the sutures should be applied or tied beforehand by one of the pieces of tubing, with threaded needles in each of the opposite loops, ready for transfixing the tissues and tying over the other piece of tubing. The forceps are removed and the tumor excised close to the rubber tubing. Wright⁴ thus operates: The pile is drawn down with tenaculum forceps and is clamped with pressure forceps and the portion of the pile below the pressure forceps is cut off with the scissors or knife; a needle armed with a catgut suture is carried around and above the jaws of the pressure forceps so as to include all the stump of the cut off pile. One end of the suture projects from one border of the pile-stump, and the other end projects from the other border. The ends of the suture are put together in the first step of the surgeon's knot. The pressure forceps are unlocked and removed, being extracted from the loop of the suture, and this loop is at once drawn tight and the tying completed. [This operation bears a resemblance in its principle and details to the well-known procedure of Esmarch, a picture of which will be found in his last work on operative surgery.]

Osteoplastic Resection of the Sacrum is discussed by Kammerer.⁵

¹ Med. Rec., Dec. 8, 1894.

² Boston Med. and Surg. Jour., Feb. 1, 1894.

³ Mathew's Med. Quarterly, July, 1894. ⁴ Med. and Surg. Rep., 1894; lxx., No. 29.

⁵ Med. Rec., July 29, 1894.

He describes the operations of Kraske, Hegar, and Bardenheuer, in which the portions of bone were definitely removed, and states that among the drawbacks alleged to attend such operations are weakening of the pelvic floor, interference with the bladder and rectal functions, loss of the attachment of the sphincter-ani muscle, with the subsequent disuse of that muscle, and kinking of the rectum due to cicatricial tissue about the end of the divided sacrum. As these results are, however, extremely rare, he says we have the right to demand of an osteoplastic method that it must possess technical



Fig. 31.—Several lines of incision for Kraske's resection of sacrum: *a e* represents Bardenheuer's method (Medical Record, July 29, 1894).

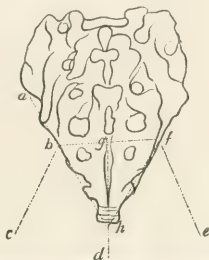


Fig. 32.—Rydygier's osteoplastic resection of sacrum (Medical Record, July 29, 1894).

advantages if it is to be preferred to the measures mentioned. Kammerer recommends the plans of Rydygier, and the accompanying cuts show the incisions through the sacrum for the temporary removal of the lower end of the bone and the coccyx. (Figs. 31 and 32.) Rydygier incises the soft parts, beginning at the posterior superior spine of the ilium on the left side, and running down to the tip of the coccyx, thence in the median line to the anus (*a b h a*). After division of the sacrosciatic ligaments, the soft parts are removed from the anterior surface of the sacrum by the hand of the operator. A transverse incision is then added below the third sacral foramina (*b f*), and the bone divided along this line with a chisel. The flap, *f b h*, is now turned to the right side upon *h f* as an axis. With a retractor inserted at the tip of the flap (*b*) the latter can be easily held aside, and manipulations about the rectum can be as readily carried on as when the bone has been entirely removed.

DISEASES OF THE BONES AND JOINTS.

Diseases of the Bones.—Latzko¹ made an experimental study on *osteomalacia*, and found that in the majority of cases chloroform-anesthesia was followed by marked improvement in the symptoms, that this improvement

¹ Wien. klin. Wochenschr, No. 29, 1894.

was rapid, but that in almost all the cases after a time the condition again changed for the worse.

Von Frey¹ advises the employment of *celluloid plates to replace the bone-defect of trephining*. The plates should overlap the defect on all sides about $\frac{3}{4}$ in., the periosteum being raised to cover the margin of the plate. The healing is uneventful, the plate does not become absorbed, but a mass of new bone covers its margins. There is no union with the brain-membranes, no protuberant callus, and no consequent irritation of the brain.

Martin,² as to the *filling of cavities of bone*, made a series of experiments on dogs, in which cavities were produced in the tibiæ and were filled with gutta-percha or plaster-of-Paris. After healing of the incision the animals were killed months afterward. [As in filling teeth, the difficulty seems to lie in making the cavity absolutely aseptic. Attempts have been made to secure asepsis by pouring in boiling oil, but superficial necrosis is apt to result from this proceeding.]

McBurney³ presents the record of an interesting case in which after excision of half of the lower jaw he immediately inserted an *interdental splint* to prevent displacement by unopposed muscles. Later a spring was inserted, one end being fastened to the divided lower jaw and the other to the posterior molar teeth of the upper jaw. This was soon replaced by a set of artificial teeth, with a pad of gutta-percha to fill out the cheek on the side of the operation. As soon as the interdental splint is removed and a spiral wire spring is applied the patient can at once begin to cultivate the use of his muscles and soon acquires voluntary power in the jaw. [Michaux, something over a year ago, resected half of the lower jaw and at once inserted a substitute made of hard rubber. The wound healed by primary union, and on the twelfth day the patient was moving his jaw naturally and speaking well. This operation, in which an artificial substitute is immediately introduced, was devised by Martin of Paris in 1889.]

Concerning the *septic osteitis of childhood*, Owen⁴ tells us that a diagnosis of traumatism is sometimes erroneously made when this condition is present. Septic osteitis may arise without any history of injury, but usually the patient's nutrition has been disturbed by some previous sickness. All the tissues of the body have thus been rendered susceptible to infection. The region of new bone at the end of the diaphysis is a delicate point of least resistance, and any septic organisms that have entered the body can readily lodge there, undergo cultivation, and by their products disturb the blood and the nervous system. In some cases the disease is so acute that death occurs before a positive diagnosis can be made. In other cases its progress is slow and somewhat resembles that of rheumatism. Unlike rheumatism, however, the local symptoms, though they are close to the joint, do not involve it, and

¹ Wien. klin. Wochenschr., No. 8, 1894.

² Centralbl. für Chirurgie., No. 9, 1894.

³ Annals of Surgery, July, 1894.

⁴ Lancet, May 26, 1894.

thickening may be detected below the junction cartilage. Acute rheumatism as a rule is rapidly improved by the use of salicylic acid or the salicylates. Septic osteitis is unimproved by these drugs. Early diagnosis is imperatively necessary because the treatment is essentially surgical and delay may prove fatal. Incision should be made before pus is formed. The incision goes through the periosteum, and if any pus is found a very free opening is made. The diaphysis is trephined to give exit to all matter dammed up within the bone.

Klemm,¹ concerning *bone-disease in typhoid fever*, says the most common bone-complication is restricted to the cortical layer of the bone. The inflammation may end in resolution, in caseation, or in liquefaction. This form of bone-inflammation is likely to be accompanied with suppuration of the medulla, and is due to mixed infection with two species of microorganisms. An examination of the exudate showed the typhoid bacillus. In those cases in which suppuration occurred staphylococci and streptococci were found. In some few cases no pus-organisms could be found, even though suppuration had taken place, and these cases must have been due to the persistent action of the typhoid bacilli. Experiments made upon rabbits showed that if a pure culture of typhoid organisms were injected into the veins of the ear, in five out of ten animals the organisms could be found in the medulla of the femur in from ten hours to twelve days. Several of the animals, after the typhoid infection was brought about, were given injections of the pure culture of staphylococci, and the animals that lived developed an acute osteomyelitis with separation of the epiphyses.

FRACTURES.

The Ambulatory Treatment of Fractures is the title of an article by Harting.² He comments on the strange silence of American literature upon this subject, and tells us that the treatment was not devised by a surgeon, but by an instrument-maker named Hessing. In applying the apparatus the patient sits upon the ischial tuberosities, extension is applied to the foot toward the cross-bar of the apparatus, and the sole of the other foot is raised by a cork sole. Bruns' modification of this apparatus permits in children an extension of from 52 to 72 cm., and in adults an extension of from 72 to 92 cm. The apparatus used by Bernerleys weighs but a trifle over two pounds. Counterextension is often entirely unnecessary, the weight of the leg being quite enough. The seat of fracture above and below is encircled with a thin plaster cast, which is applied to the naked, shaved, and oiled skin.

Albers has devised an ambulatory dressing by the use of plaster alone. He includes the limb up to the iliac crest and strengthens the plaster by glue and strips of wood put on after swelling subsides, and he permits the

¹ Archiv für klinische Chirurgie, 1894.

² Buffalo Med. and Surg. Jour., 1894.

patient to walk one week after the fracture. The apparatus projects beyond the sole and has a space between it and the sole. The advantage claimed for the ambulatory dressing is, that besides infinitely mitigating the discomforts of the patients, union is actually favored by the gentle stimulation of walking. No ununited fractures have been reported. [Bardeleben reported to the German Surgical Congress 116 fractures of the lower extremities treated by the



Fig. 33.—Apparatus for ambulatory treatment of fractures of thigh (Buffalo Med. and Surg. Jour.).

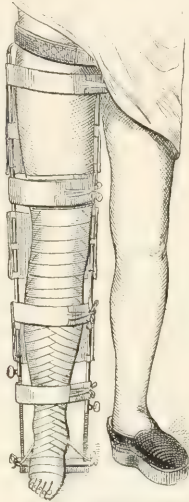


Fig. 34.—Application of ambulatory dressing (Buffalo Med. and Surg. Jour.).

ambulatory method. Eighty-nine of these fractures were of the leg, 12 of them compound, and 22 were of the thigh, 5 being compound. The patient was able to rise from bed and get about in a few days. The sufferers attended to business and were saved the inevitable muscular atrophy following confinement to bed. The appetite, digestion, and sleep were those of perfectly healthy individuals. The ambulatory treatment would seem to be of especial value in old people and in habitual drinkers.]

Landerer's Method of Treating Fractures is presented by Joseph Lumnitzer.¹ He tells us that in the surgical clinic of Buda-Pesth, between 1880 and 1891, the study was

made of 552 simple fractures, and from this study the following views were derived: In order to fix the time of healing of the fractures, two days can be taken, first, when callus has developed sufficiently between the ends of the broken bones to prevent preternatural mobility; second, when the functional activity of the limb is restored. The return of functional activity is the proper test of the time required to heal a fracture. The time required for the complete return of functional activity after the bones have joined forms from one-third to two-thirds of the time occupied in the junction of the fragments. The longest time for union was the case of the fracture of the femur, fifty-seven days, and the shortest in the case of a fracture of the metatarsus, twenty-three days; of clavicle, twenty-four days; of the forearm and fibula, thirty-five days; of the tibia, thirty-nine days; and of the patella, fifty-two days. After the union of the bones a further period is

¹ *Lancet*, Oct. 27, 1894.

needed,—for the patella, eighty-three days; femur, eighty-one days; the humerus and tibia, sixty-two days; the fibula, fifty-nine days; the ulna and clavicle, thirty-nine days. The average further period required for active mobility amounted, in the forearm, to only one-half the time needed for union of the bones, namely, from fifteen to thirty-two days. Elsewhere it requires two-thirds of the time. The author tells us that with a slight inaccuracy we can obtain the time of functional mobility if we add to the time required for union of the fragments fifteen days for the collar bone and bones of the forearm, and thirty days for the humerus and the bones of the lower extremity. In Landerer's method the ends of the bones are replaced at once after the fracture and put up in a firm dressing, preferably of plaster-of-Paris, until the disappearance of the swelling due to the injury. When the provisional callus is fully formed, a process that requires from eight to fourteen days, the callus and adjacent muscles are massaged twice daily, and the mobility of neighboring joints is secured by active and passive movements. In 93 cases thus treated, of which 89 were simple fractures and 4 were compound fractures, the results were as follows: Fixation of the bones in from twelve to thirty-six days; the time between union and functional activity was generally not more than ten days, with the exception of the femur, in which it was fifteen days, and the bones of the forearm, in which it was thirteen days. Under the old method of treatment, in order to bring about consolidation, from twenty-four to fifty-seven days were required, instead of, as in the present treatment, from thirteen to thirty-six days. Whereas the old treatment, to bring about a return of functional activity, required from thirty-nine to eighty-three days, in Landerer's method it is brought about in from fourteen to fifty-one days. Thus Landerer's method of treatment saves one-third of the time requisite for consolidation and one-third of the time necessary for mobility. The treatment cannot be used in comminuted fractures, or when there is a strong tendency to displacement of the fragments.

Colles's Fracture.—Doyle¹ has advocated the use of a splint in the treatment of Colles's fracture. Several thicknesses of cloth or flannel are cut into shape, are dipped in plaster-of-Paris cream and secured by a roller to the normal arm, while the hand is slightly flexed. After the plaster has set it is removed and allowed to dry. The fractured arm, which in the meantime has had the displacement reduced, is placed in this anatomically made splint, which retains the bones in their natural position by the aid of a roller bandage. No posterior splint is required.

[Pilcher has demonstrated that the deformity of Colles's fracture is very largely maintained by the constricting or binding power of an untorn slip of dorsal periosteum. Hyperextension will relax this band, and pressure by the fingers of the surgeon upon the lower fragment will correct the displacement. Pilcher and Conner have both demonstrated that a band around

¹ Internat. Jour. Surg., July, 1894.

the wrist is all that is necessary to maintain the correction of this deformity. Conner believes that because of the liability of the surgeon to damage-suits, and the ignorance of juries who give verdicts upon these cases, it is safer to wear a splint, but the splint should not extend below the line of the wrist and the hand should be permitted to hang free. Dr. Peterson approves of simply hanging the hand in a sling in the position of pronation. This position and treatment affords ready access to the seat of fracture. Bardeleben approves of this treatment.]

Fractures of the Lower End of the Humerus.—Allis¹ presents his well-known views in advocacy of the straight position in the treatment of fractures of the lower end of the humerus. He tells us that the advantages claimed for the flexed position are that it is convenient and that the patient can be up and about, and that if ankylosis ensues, it is in the most convenient position for use of the extremity. The first supposed advantage he considers immaterial, and quotes Levis to the effect that there is no more reason why a man should stay out of bed with a fractured clavicle than with a fractured femur. In regard to the second reason, he tells us that these fractures are usually due to indirect force, and that as a consequence ankylosis will be rare, because ankylosis is not likely to occur except from direct crushes in which the fragments are comminuted. In treating fractures of the inner condyle by the anterior angular splint, the carrying function will be inevitably lost because the inner condyle will be separated from the humerus and carried upward. He holds: 1. That the extended position gives promise of the best circulation and is best suited to combat inflammation. 2. It permits of extension of the entire limb and of comparison with its fellows. 3. The dressing can be applied with ease and simplicity. 4. If either condyle is unbroken this position gives us a natural splint by which articular surfaces can be preserved. 5. It is the position in which we dress fractures of the lower end of the femur with the result of perfect joints. The patient stays in bed for one week after the accident, with the limb on a pillow. The limb is covered with a spiral flannel bandage, after all swelling subsides, and we rub in plaster or cover the bandage with adhesive plaster. Complete restoration of function is only attained after months.

Landerer² treats fractures of the lower end of the humerus by fixation or extension, with early massage and the use of gymnastics. In cases in which dislocation is not to be feared he uses fixation. In more difficult cases, when there is a tendency to dislocation, he makes extension and uses Hamilton's bandage, the patient walking about. In very difficult cases he uses extension for a week or a fortnight while the patient is in bed. It is indispensable, he tells us, to frequently inspect the seat of fracture, to detect at once any deformity. So soon as there is no fear of the callus bending, the dressing is to be so adjusted as to permit massage to be begun. Treatment

¹ Jour. Am. Med. Assoc., July 14, 1895.

² Brit. Med. Jour., Nov. 3, 1894.

is thus very materially shortened, and joint-stiffness, tendon-adhesion, muscular atrophy, and edema are avoided.

Injuries of the Elbow.—A most important article on treatment of injuries about the elbow is by Robert Jones¹ of Liverpool, who says the difficulty experienced by surgeons in making accurate diagnoses of these injuries, the ease with which grave blunders can be made in prognosis and treatment, and the fear of limitation of function of the joint, render these injuries less attractive than they might otherwise be. In 1892 he treated some 70 cases of severe injury of the elbow. In 1893 he tabulated 110, and in 1894, to the end of July, 63 cases. Some years ago he felt dissatisfied with the use of the outer and inner rectangular support, and introduced the posterior rectangular thin sheet-iron splint, with the kettle-handle interruption at the elbow. But this splint he now rarely uses, and in fact restricts it to those cases of compound fracture with loss of bones in which dressings have to be associated with fixation, and when ankylosis may be expected. During the time he used this splint he met with two bad results: the one was a case of intercondyloid fracture in a boy, which at the end of six weeks seemed firmly ankylosed. The other was a simple backward dislocation in a girl of twelve, who had at the end of five weeks exhibited a firm ankylosis, with retention, however, of supination and pronation. In the first case Jones forcibly extended, supinated, then acutely flexed the elbow. He applied a bandage around the neck and kept the arm in this position without examination for several weeks. The second case was treated in a similar manner and both made recoveries with excellent motion. His object of acute flexion was to secure for the bones a position sufficiently changed to lessen the risk of old adhesions reuniting, and at the same time to give the articulation absolute rest. The late Mr. Thomas was accustomed, in his treatment of tubercular elbows, to place the joints at a flexed position, a little less than 45°, and his results were remarkably successful, for the reason, Jones thinks, that no constriction by splint or bandage interfered with the physiologic activities of the joint. He thinks the splint and bandage are largely responsible for the stiff joints that follow elbow-injuries. He now advocates, in all injuries of the elbow excepting fracture of the olecranon, flexion to an acute angle and maintenance in this position until all inflammatory symptoms have subsided. This routine practice should be adopted whether an accurate diagnosis has or has not been made, for he finds that it is only gentlemen of very limited experience who never fail to diagnosticate an elbow-lesion. In cases of subluxation of the head of the radius, we should supinate and acutely flex the arm and hold it in this position for about a week. In case of sprain, simple or severe, we should supinate and acutely flex, for in that position the elbow cannot be further flexed, checked as it is by the neck, and the halter will not admit of extension. In case of separation of epiphysis or fracture

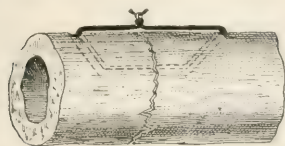
¹ Provincial Med. Jour., Dec., 1894, and Jan., 1895.

above the joint, we should again extend, supinate, and flex. This will correct the displacement of the lower end of the humerus. In dislocation backward the same motions and the same treatment should be pursued. If the radius is dislocated inward and forward, the same treatment is indicated. If the fracture be intercondyloid or T-shaped, the position of acute flexion has the advantage that it secures at once the right of way before exudation of callus and displaced condyles can prove obstructive. In separation of the inner condyle there is no better way to keep it from the common downward displacement than by acute flexion to relax those muscles that govern its direction. He usually applies the Thomas halter, which is simply a bit of leather tubing, to protect the neck, through which a bit of bandage is attached to a leather band around the patient's wrist. The ball of the thumb rests against the neck. No splints should ever be applied, and the arm should be kept in this position from three to six weeks. Jones never uses passive movements until the stage of consolidation and inflammation is past. He emphatically protests against the advice to begin passive movements in the second or third week. He thinks early passive movements, if there be a fracture, produce the exudation of more callus. If there be inflammation of joint-structure, it causes more plastic effusion, and when neither of these conditions exist, there is no object in so prolonged restraint as to render passive movements necessary, and the object of the surgeon in treating fractures of the joints should be: 1. To allow of free circulation. 2. To obtain complete rest. 3. To assume a posture in which the callus-exudate shall not unduly hamper the joint-movements. Nor should the sling be disregarded. In the case of dislocation in from three to four weeks; in a fracture through the shaft or through the condyles of the humerus, in from five to six weeks. When the surgeon thinks the time for movement is about due, he should slacken the sling so that the hand falls a couple of inches; in three or four days the patient is asked to raise his hand to the position from which it has dropped; if he fails, the sling has to be readjusted; if he succeeds, the sling may either be dropped lower or dispensed with. If after a few days' opportunity the hand fails to respond to the invitation offered by the slackened bandage, then we fear ankylosis and act accordingly in the interests of a useful limb. [Several of our cases treated by this plan persuade us of its great value.]

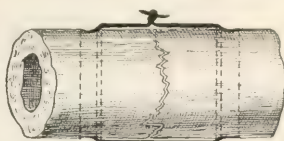
False Joints.—Delorme¹ introduces a new procedure for the cure of false joints in the long bones. He put it into practice in the case of a soldier who had a splintering gunshot fracture of the upper extremity of the humerus. The fracture did not consolidate and there was shortening of $1\frac{1}{2}$ inches. An anteroexternal incision was made, the splinters preventing approximation were removed, intervening fibrous tissues were cut away, the end of the lower fragment was rounded, and this fragment was introduced

¹ *L'Union Médicale*, Aug. 21, 1894.

into a hollow made in the upper fragment and the two fragments were sutured together. Forty days completed the cure. [Senn, as a result of an elaborate



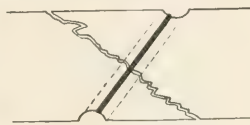
Old method of bone suture.



Improved bone suture.



Lateral groove for wire.



Peripheral groove for wire.

Fig. 35.—Methods of mobilizing fractures by sutures (Senn, *Annals of Surgery*).

study of ununited fractures, concludes that bone-sutures and nails of metal, bone, or ivory, when applied in the usual way, will not immobilize a fracture



Fig. 36.—Old method of wiring oblique fracture, showing inevitable deformity (Senn, *Annals of Surgery*).

that has a tendency to displacement (Fig. 36). A solid interosseous splint of ivory or bone interferes with the production of intermediate callus and is not



Fig. 37.—Bone ferrules (Senn, *Annals of Surgery*).

absorbed. Senn advises hollow, perforated cylinders of bone or ivory. In

an oblique fracture a bone ferrule is made to surround both fragments and secure fixation (Fig. 37), the wound being closed without drainage and the

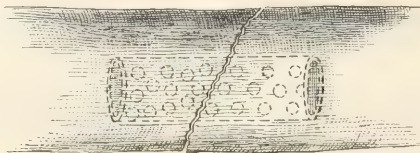


Fig. 38.—Perforated infraosseous splint (Senn, Annals of Surgery).

limb being put up in plaster. Figs. 38, 39, 40, show the application of these cylinders and ferrules.

There can be no doubt that Gussenbauer's clamp will often give a good

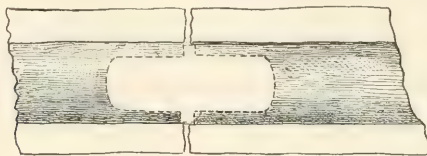


Fig. 39.—Bone cylinder, solid (Senn, Annals of Surgery).

result in ununited fracture. It was used for years by Billroth. It should be applied with careful asepsis. Lannelongue has recently published some

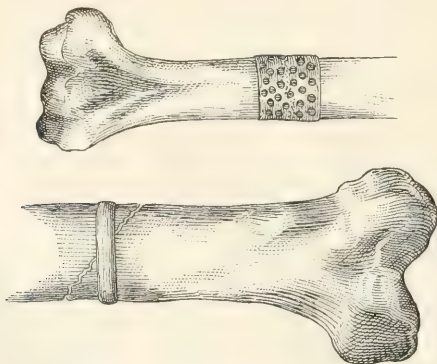


Fig. 40.—Bone rings and ferrule applied (Senn, Annals of Surgery).

interesting experiments performed upon rabbits. He found that zinc chlorid injected into the periosteum caused bone-formation. Ménard applied the

suggestion in a case of ununited fracture of both bones of a man's leg. No union was noticeable two and a-half months after the accident. Ménard injected 1.25 g. of a 1 : 10 solution of zinc chlorid. The injection was made along the outer and posterior surfaces of the tibia, and in the space between the fragments. The parts were immobilized for one week. Union was perfect in one month.]

Delayed Union.—Buechner¹ advocates artificial hyperemia in the treatment of delayed union. For instance, in a fracture of the humerus we should apply a flannel bandage from the fingers to a point about $1\frac{1}{2}$ inches below the fracture, and $1\frac{1}{2}$ inches above the fracture we should apply a piece of rubber bandage that will retard the return of venous blood, but will not interfere with the arterial circulation; this produces marked congestion in the parts around the fracture. At first the constriction is permitted to remain only a short time, but the duration of its application is rapidly increased until it is soon left on day and night. Its almost continuous application for a period of ten days suffices in many cases to effect a cure. During the employment of this method the fracture should be immobilized; in the upper extremity this is accomplished by splints; in fracture of the leg a plaster-of-Paris dressing is employed and a constrictor is applied at its upper margin; in fracture of the femur the extension-apparatus is used, the flannel bandage and constrictor being applied as in the case of the humerus. This method should not be used when there are varicose veins. [This plan of treatment was introduced by Helferich in 1887.]

Fixation in the Treatment of Fractures into Joints is the title of an article by Cook,² who holds that bony ankylosis, or rather, fibrous ankylosis, is the result of injury or inflammation and not of immobilization, and that early passive motion disarranges the fragments, increases the production of callus, irritates the ligaments, increases inflammation, and tends actually to produce ankylosis. Immobilization is useful only during active inflammation or until the ruptured ligaments and broken bones have united. The logical treatment of a fracture into a joint should be rest and local applications to combat inflammation, with reduction of the fracture as early as possible, and immobilization until the bones and ligaments have united—that is from three to eight weeks, and passive motion, massage and use of the part until the tissues become normal, or if the massage fails, rupture of adhesions under an anæsthetic.

The Treatment of Impacted Extracapsular Fracture of the Neck of the Femur is considered by Southam,³ who states that the treatment usually adopted in these cases consists in keeping the leg at rest without making any attempt to overcome the characteristic deformity. The result in most cases is very unsatisfactory, for the leg remains shortened and everted.

¹ Jour. Am. Med. Assoc., May 26, 1894.

² Internat. Jour. Surg., Aug., 1894.

³ Lancet, Nov. 17, 1894.

He advocates giving the patient ether at once, breaking down the impaction, correcting the eversion and shortening and applying the extension apparatus, associated with the long, straight external splint.

The Treatment of Fracture.—Lane,¹ in a very able article, affirms that in fractures of the long bones of the upper extremity it is not so vitally important to reconstitute the damaged skeleton in its original form as it is in the case of the lower extremity. He tells us that after a certain age fractures in the lower extremity are likely to produce permanent changes, and that even in the slightest forms the patient is liable to experience a feeling of insecurity and discomfort. In marked forms of fracture there is a high degree of pain that sooner or later absolutely incapacitates the sufferer from transmitting the weight of the body through the joint or joints of the leg for any useful purpose. He takes up for discussion fractures of the lower extremity, and points out as regards the mechanical treatment in all cases (excepting transverse fractures in which there is no displacement of the fragments, or in which there is so little hemorrhage and swelling that the broken surfaces can be brought by traction and manipulation into accurate apposition) we must be guided by two important principles: First, the axes of the fragments must be made to correspond. This is generally done by putting the patient supine and at rest, and by observing the foot of the sound limb, and gauging by this limb the position to place the injured limb. The foot of the damaged limb is made to form an equal angle with the vertical, and by this means the axis of the lower fragment will be made to nearly correspond with that of the upper fragment when the opposition exerted by the shortening of the soft parts about the bone due to hemorrhage and inflammatory exudate has been removed by traction. Second, the traction must be exerted beyond the seat of fracture until the blood and inflammatory material are absorbed sufficiently to allow the fractured surfaces to be brought in apposition. The amount of traction varies with the amount of hemorrhage and subsequent inflammatory effusion. Lane did not become aware of the immense influence of inflammation and hemorrhage upon the ties in the length of the bone and the enormous resistance they could offer, until in 1893, when he cut down upon a simple fracture of the tibia and fibula with a view to securing union by the use of screws. He found a very moderate amount of hemorrhage and effusion was sufficient to resist any traction that he was able to exert upon the foot and lower fragments, and he had to use the elevators and a lion forceps before it was possible to bring the broken surfaces together. The supposed shortening due to prolonged muscular contraction described in the text-books is practically nonexistent, the real shortening as a rule being due to the shortening of all the ties, that is of the soft parts about the bone, by hemorrhage and inflammatory effusion into them. In treatment of fractures of the tibia and fibula, especially those that are oblique, he calls

¹ Brit. Med. Jour., April 20, 1895.

attention to the survival of the vertical foot-piece and demonstrates its capacity for harm. He considers the treatment by plaster-of-Paris, or other similar materials, as both cheap and bad. He believes that a proportion of fractures of the tibia and fibula occurring in working people during or after middle life, may be treated satisfactorily by extension, but he is thoroughly persuaded that if oblique fractures of both bones occur low down, the wise course is to make an incision throughout the continuity of the bones and fasten them with screws. The physical conditions in fracture of the femur lend themselves much more readily to treatment by apparatus than those that exist in fracture of the tibia and fibula. But even in fractures of the femur difficulties may exist that render it advisable to incise and fasten the fragments. Of all of the fractures of the lower extremity none lends itself more readily and at less risk, to operative interference, than the conditions resulting from excessive forcible abduction of the foot, that is, what is known as Pott's fracture.

Beddoes,¹ in an article upon the treatment of fractures, states that it is perfectly clear that the objects we should strive for in the treatment of fractures is to replace and fix the bone in its original position, and it is also plain that the conditions are such as cannot be entirely remedied by splints. To go on treating fractures by such means, when in so many cases the result is bad or disastrous, could only be justified if there were absolutely no other means of treatment. The method that he strongly advises is that the surgeon cut down upon the seat of fracture, and unite the fragments by screw or wire. The only possible objection to this will be raised by those who are doubtful of the success of their antiseptic precautions.

Deanesly,² agreeing with many of the views of Lane, denies that the results obtained by ordinary methods of treatment are as imperfect as he represents. Deanesly approves of the use of plaster-of-Paris, and treats cases of simple fracture of the leg by the application of a plaster cast within a few hours of admission. This is applied with the patient lying on his back with the knee and hip flexed to a right angle, while an assistant keeps up traction on the foot, the vertical position of the thigh being maintained and serving for counterextension. In this method of application the most oblique fracture falls into position without trouble, and by placing the sound limb in a corresponding position, it is easy to obtain a proper position as regards rotation. After the plaster sets, the limb is kept in the same position in a sling cradle until the fourth or fifth day, when, the swelling having gone down, the leg is allowed to lie in any position on the bed for a week or ten days, when the patient goes about on crutches. When the fracture was at or above the middle of the leg, the plaster was continued a little above the knee so soon as the limb was allowed to lie straight on the bed. Because of the perfect results obtained by this method, even in very oblique fractures of the tibia

¹ *Lancet*, June 1, 1895.

² *Brit. Med. Jour.*, June 15, 1895.

and fibula, the author would be willing to adopt operation in only a very few exceptional cases. [Our views accord with those of Deanesly, that the results of treatment in these cases are usually good, and operation should be the exception rather than the rule.]

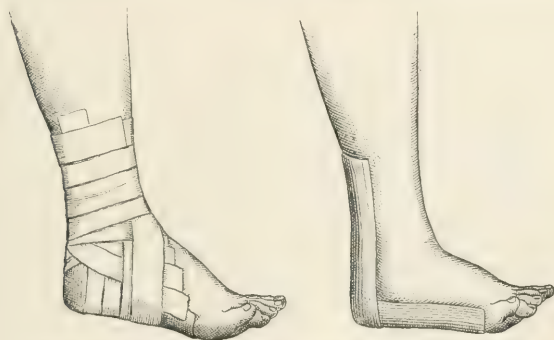
JOINTS AND DISLOCATIONS.

The Operative Treatment of Paralytic Flail-Joint is the title of a most valuable article by Jones¹ of Liverpool. He tells us that our leading surgeons are prone to take a pessimistic view of the limitations of their art in the treatment of flail-joints following poliomyelitis. In the last ten years he has had under his care 600 cases of the effects of poliomyelitis, and a not inconsiderable number of them exhibited complete paralysis of the muscles, influencing movement in both knee and ankle, or in ankle only. The difficulty and expense connected with the purely mechanic treatment of these cases are very great, extending, as does the necessity, over an entire lifetime. Because of these considerations he concluded to try and transform the flail limb into a member approximating as closely as possible to the splint which he wished to discard. In a large majority of the so-called complete paralysees the psoas and iliacus muscles are unaffected and all mechanic means are based upon the integrity of these muscles. The knee and ankle are kept fixed, and the psoas muscle is prepared to carry the leg, splint and all. In consequence, the more weakly paralytics very easily tire by the weight of their supports, and so fail of availing themselves of the opportunity presented to strengthen their only pair of muscles of progression. Jones's operation is to ankylose the knee and to partially ankylose the ankle. He appends 15 cases operated upon by this method. The operation consists in opening the joint, peeling off the superficial area of cartilage from the whole of the articulation in the case of the ankle, and gouging the bone in the case of the knee, keeping the joint completely at rest for some weeks subsequently, and fitting the patient with a simple apparatus that will enable him to walk without straining the newly fixed joints, which apparatus he wears for a considerable length of time. An excision is more than the case requires, and involves an additional shortening of the limb. To expose the knee he makes an incision across the front of the joint, passing below the lower edge of the patella. The flap is turned up and the vessels are ligated, the semilunar cartilages are removed, the cartilages in the underlying layer of bone being peeled away so as to leave a raw surface. The crucial ligaments are left intact. The structures are then carefully reunited by deep and superficial sutures. No drainage-tube is employed. In the ankle-joint the operation is conducted in one of two ways: In old cases, when the foot has assumed the equinovarus position, he forces the foot into a position of extreme equino-

¹ Provincial Med. Jour., Dec., 1894, and Jan., 1895.

varus, makes an incision immediately in front of the external malleolus, following the line of the ankle-joint and dividing all structures down to the astragalus, generally only severing the peroneus tertius tendon. The other tendons are held aside and the articulating surface of the astragalus exposed. By means of a gouge he removes several grooved portions of the articulating cartilage. If complete bony ankylosis of the ankle be desired, it will be necessary to gouge bone. If a fibrous ankle is desired, it will be only necessary to peel off parts of the cartilage. The ankle is kept extended, while some pieces of the articulating surfaces of the tibia and fibula are removed. A few vessels are tied, the foot is placed in its normal relation to the leg, and a suture or two closes the wound. In some other cases the astragalus is more easily approached from behind, and in such the foot is firmly flexed on the leg, and an incision down to the bone is made along the external border of the tendo-Achillis. The posterior ligament is cut and the gouging takes place as directed.

The Treatment of Sprains.—In a valuable article by Van Arsdale and



Figs. 41, 42.—Gibney's method of strapping in sprains of ankle (N. Y. Med. Jour.).

Gallant,¹ they give the results of treatment of 1231 recent sprains. They advocate the use of massage, claim that most superior results are secured by it, discuss its effects, explain the pathologic results in joints that follow sprains, and detail at length the method of applying massage which was devised by Van Arsdale. They sum up their conclusions as follows:—Massage should not be applied in bacterial inflammations; massage prevents swelling, or rapidly disperses it if it exists; prevents pain or quickly removes it; prevents stiffness or overcomes it; prevents the sense of weakness, or restores the part to its original vigor and strength; reduces the period of treatment from weeks to days; permits the use of the injured member.

¹ Med. News, April 20, 1895.

Gibney¹ sets forth his treatment for sprains of the ankle after a method which he learned originally from Dr. Davis, of the U. S. A. Strips of rubber plaster are applied so as to include the heel and the ankle-joint. This article contains cuts that indicate the methods of application (Figs. 41, 42). For instance, in a sprain about the internal malleolus, a strip of rubber plaster 12 inches in length is applied, beginning at the outer border of the foot near the little toe and ending on the inside of the foot. The second strip is applied vertically and passes from about the junction of the middle with the lower third of the leg, down alongside the tendo-Achillis, over the heel, and terminating just above the internal malleolus, but posterior to this.

Resection of Humerus.—Pean² resected the upper part of the humerus and inserted an artificial substitute after the manner recommended by Gluck. The substitute was made of caoutchouc and platinum. It was firmly sutured to the inferior half of the humerus, its upper extremity, bearing an articular surface, being fixed in the glenoid cavity. Over this the capsule and periosteum were sutured and the wound was closed, a drainage-tube being left in place. The result was extremely favorable: the patient was up on the twelfth day, left the hospital on the twentieth day, and recovered the use of his joint.

Excision of the Wrist.—Studsgaard of Copenhagen advocated a method of excision of the wrist, which has been adopted by Mynter and is discussed by him.³ A longitudinal incision is made between the third and fourth metacarpal bones, or the second and third metacarpal bones, and then the joints between the os magnum and unciform bones and the semilunar and cuneiform bones are opened, or between the trapezoid and os magnum and scaphoid and semilunar bones. Mynter makes his dorsal incision extend up to the radius. Both superficial and deep palmar arches are severed and must be ligated in the wound, but the volar incision does not need to be prolonged further than the base of the thenar of the thumb. By thus limiting it we save the annular volar ligament. By careful dissection from the back and forcible separation it is easy to avoid injury to the dorsal tendons and the volar tendinous bursa. After this incision the whole carpus is widely opened, and by means of the scissors the carpus is extirpated and the surfaces of the radius, ulna, and the metacarpal bones are removed by a fine saw. The wound is sutured and packed with iodoform gauze. [This method of incision greatly simplifies an operation that has previously been both complicated and unsatisfactory. It might be a good plan in some cases of hemorrhage from the deep palmar arch from accident, in which the arch was inaccessible to ligation, to make a portion of this incision and tie the arch in the wound in preference to the older devices of using a graduated compress in the palm, or of tying the radial and ulnar arteries.]

¹ N. Y. Med. Jour., Feb. 16, 1894.

² Gazette des Hôpitaux, No. 32, 1894.

³ Internat. Jour. Surg., 1894, vol. vii., No. 8.

Senile Rheumatic Arthritis.—Lowe¹ recommends the use of forcible movements in the treatment of senile rheumatic arthritis, and presents the methods of procedure in the hip-joint as an example. In every case, whatever the stage of the disease, the adhesions in the joint and around the joint should be forcibly broken up and the joint be placed in full extension. In the early stages chloroform is usually unnecessary, and the patient should be encouraged to walk immediately after operation. In the latter stages an anesthetic is necessary. He emphasizes the importance of thoroughly extending the limb, because without this maneuver recovery is impossible. In order to do this he places the patient upon his face, steadies the pelvis by pressing on the sacrum with the left hand, while with the right hand the limb is extended. In mild cases this procedure brings about instantaneous recovery, or, that is to say, a condition in which the patient can walk without pain. In more advanced cases the joint will require complete rest on a Thomas's splint for a longer or shorter time. [In these subjects such a procedure might easily produce intracapsular fracture.]

Injuries of the Semilunar Cartilages of the Knee.—Pauzat² says that a diagnosis of this injury is to be made by observing subcutaneous ecchymosis, pain elicited by pressure on the cartilage, the appearance of an enlargement of the meniscal prominences appreciated by the touch and occasionally by the sight. He recommends compression with cotton and immobilization. The most common injury is luxation of the cartilages upward. It is not allowable to make a diagnosis of luxation in a case in which pain is felt on rising from a crouching position; this is due in most instances to partial lacerations of the cartilages or meniscopatellar folds. Luxations inward, behind, and in front are not recognized clinically. In treating these luxations, extensive movements of the limb, such as flexion, extension, and rotation, tend to replace the cartilage. Subsequently the part is bandaged with cotton and the joint immobilized in an extended position. This treatment should be pursued for several months. If this fails, it is proper to open the joint and suture the anterior part of the meniscus to the retracted meniscopatellar fold, or to excise the displaced cartilage. [Occupations in which an individual has to kneel for long periods predispose to this injury. Annandale's statistics exhibit this fact. The difficulty in diagnosis is considerable, as the joint may become locked by a loose body, fat in the joint, the projection of a tumor from the synovial membrane, or hypertrophy of the pad of fat beneath the patella. A point of distinction set forth by Turner, is that the cartilage always projects from the same spot, while a loose body might appear at any part of the joint. We may either remove the cartilage or stitch it. Either operation gives a good result. Prof. Annandale has said that internal displacements of the cartilage were not relieved by bandaging or any kind of apparatus whatever, but as the operation is not free from risk, he only advises

¹ Brit. Med. Jour., Nov. 3, 1895.

² Rev. de Chir., Feb., 1895.

it when all other methods fail and in conditions giving rise to such trouble as to make the patient's life an annoyance or to prevent him from pursuing his occupation.]

Old Dislocations of the Shoulder.—Tillaux¹ advises in these cases to give the patient chloroform, and to endeavor to effect reduction by the method of Kocher and by traction with the hands. If this fails, the assistants make traction not to exceed 60 kilograms in force. If this fails, the patient is sent away and told to use his arm just as much as possible, to increase the mobility of the new joint. If he becomes able to use the arm fairly well in his occupation and without pain, no operation is justifiable. If there is great pain from pressure on the nerves, or if the patient has but a limited degree of mobility in the new joint, we should then make an incision and attempt to replace the head of the bone in the glenoid cavity. If replacement is found to be impossible, the head of the humerus is to be resected.

The Operative Treatment of Old Unreduced and Irreducible Dislocations of the Hip is the title of an article by Harris,² in which he tells us that the methods of operation are four: 1. Subcutaneous division of the capsular ligament and contracted tendons, followed by attempts at reduction. 2. Osteotomy of the shaft of the femur with correction of the position of the leg, the head of the bone being permitted to remain in its distorted position. 3. Resection either of the head alone or of the head, neck, and great trochanter. 4. Arthrotomy with reduction of the dislocation. In the operation of arthrotomy difficulties of reduction will frequently be encountered. The operation is not easy and often fails, but when it succeeds it gives the best results of any of these procedures. The impediments to reduction may be: 1. That the tear in the capsular ligament has closed. 2. That the acetabulum is covered up or filled up. 3. That the ligamentum teres has taken on a new attachment. 4. That the muscles and tendons inserted into the upper part of the femur have greatly shortened and a species of new capsule has formed about the head of the bone. In most of the failures in the operation of arthrotomy the incision has been made directly over the dislocated head of the bone, and thus the head and neck of the bone are between the operator and the acetabulum, which condition renders it difficult or impossible to excavate the acetabulum. A single straight incision should be made in front along the posterior border of the tensor vaginæ femoris, between it and the gluteus medius muscle. The head and neck are denuded of the muscular attachments into the great trochanter and shaved as far as the lesser trochanter, the attachments are cut off, or, what is better, separated by the subperiosteal method. The close proximity of the greater sciatic nerve should be borne in mind. After clearing the upper end of the femur the acetabulum, if it is filled, should be gouged out with a spoon or with a mallet and chisel. The head of the bone is then returned to the acetabulum,

¹ La Tribune Médicale, Jan. 25, 1894.

² Annals of Surgery, 1894, No. 3, vol. xx.

the wound is closed, extension is applied and the limb immobilized in moderate abduction. This immobilization is continued for four weeks. Resection is only to be practised when reduction by arthrotomy fails. The application of great force by pulleys, etc., to reduce dislocations of the hip should be absolutely abandoned in favor of arthrotomy, because great force is likely to fracture the neck of the femur, lacerate the vessels of the thigh, produce grave shock and even death.

Fracture and Dislocation of Vertebrae.—Armstrong¹ gives the record of a patient who was brought into the hospital with what seemed to be a fracture and dislocation of the eighth or ninth dorsal vertebra. There was no evidence of destruction of the cord. He could move his legs, sensation was normal, but his body was bent forward and doubled up, and he was unable to straighten himself. There was a depression at the seat of injury. The patient was anesthetized, a large pillow was placed under his abdomen, and with the assistance of two men Armstrong attempted extension and reduction. Reduction was accomplished at once, the deformity disappearing and the patient feeling much relieved. Seven weeks afterward he had developed no bad symptom.

Subcoracoid Dislocation of the Humerus.—Russell² presents a new method for reduction of this dislocation. He places the patient recumbent, takes the wrist on the injured side, raises the arm just off of the bed and waits for a few seconds. He then proceeds slowly, gradually, almost imperceptibly to abduct the arm until it is above the shoulder at an angle of 45°, but the trunk axis to be on the same plane. The surgeon should take up from two to three minutes in carrying out this procedure, because any sudden movement will develop a muscular contraction. Up to this time no traction whatever has been employed. Now, however, traction is employed, but in the same gradual and almost imperceptible manner in which the abduction was practised. The humerus will be drawn into the glenoid cavity with the greatest ease.

McBurney and Dowd³ discuss the subject of fracture of a dislocated humerus, and describe a most ingenious method of reduction, which they applied successfully to a case in which ordinary methods had failed.

The plan of procedure is as follows: Make an incision down to the bone through the soft parts in the outer side of the upper fragment; drill a hole in the bone with the instrument shown in Fig. 43, insert the hook (Fig. 44), and make direct traction upon the upper fragment in the



Fig. 43.—Fracture drill (McBurney and Dowd, *Annals of Surgery*).

¹ Montreal Med. Jour., March, 1895.

² Intercolonial Quarterly Jour. Med. and Surg., Aug., 1894.

³ *Annals of Surgery*, April, 1894.

proper direction, while the forearm and arm are carried outward and nearly to a right angle with the body. The authors suggest that in some cases of



Fig. 44.—Fracture hook (McBurney and Dowd, *Annals of Surgery*).

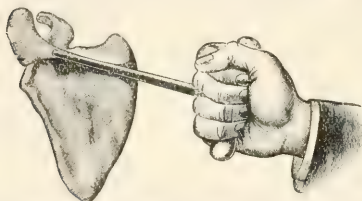


Fig. 45.—Fracture hook applied at base of acromion process (McBurney and Dowd, *Annals of Surgery*).



Fig. 46.—Fracture hook inserted in displaced fragment (McBurney and Dowd, *Annals of Surgery*).

old dislocation of the humerus, counter-extension could be applied to the scapula (Figs. 45, 46). [This plan is ingenious and practical, and a great amount of force can be used without splitting the bone.]

THE VASCULAR SYSTEM.

Thrombosis of the Superior Mesenteric Vein is discussed by Watson.¹ He presents certain symptoms which when found in association are very suggestive though not absolutely characteristic. These symptoms are: 1. Abdominal pain, which is very intense, not perfectly localized, and colicky in its nature. 2. Diarrhea. 3. Subnormal temperature. Vomiting if present adds to the probability of diagnosis, as do abdominal distention and great prostration. The presence of embolism elsewhere is said by Gerhardt and Kussmaul to be essential in making a diagnosis, but Watson shows that it occurred in but few of the 8 cases which he records. The association of

¹ Boston Med. and Surg. Jour., Dec. 6, 1894.

hepatic disease and arterial atheroma is confirmatory when found in association with the symptoms mentioned. In many cases there are no characteristic abdominal symptoms, and in these a diagnosis cannot be made. In about one-fourth of the cases the symptoms are sufficiently positive to permit a diagnosis to be made. In about one-sixth of the cases postmortem examination showed that the intestinal lesion was so limited and definite that a successful resection of the bowel could have been practised. Practically we may state that all patients who are left to themselves and who are treated by purely medical means die, hence it follows that celiotomy should be performed in all cases in which the symptoms suggest the existence of thrombosis of the mesenteric vein and in which the patient is not profoundly prostrated, or has not some necessarily fatal disease. When it is possible resection of the diseased wall of the intestine should be performed; otherwise an artificial anus should be made, the cut ends of the bowel being united by a subsequent operation.

Embolus of the Mesenteric Artery.—Lothrop¹ reports three cases of this affection and says that the diagnosis is indicated: 1. By sudden abdominal pain over a considerable area, generally including the umbilicus. 2. Nausea and vomiting, the vomited matter in the late stages being bloody. 3. General abdominal tenderness. 4. Diarrhea as a late symptom, the stools being usually bloody if the patient survives for several days. 5. Shock, with constitutional disturbance, such as would be expected in any case of acute intestinal obstruction. Before arriving at a diagnosis of embolus of the mesentery artery we must consider and rule out volvulus, intussusception, strangulation from bands or cords, hernia of all kinds, perforation of gastric or duodenal ulcer, and acute pancreatic affections. A complete physical examination should be made. The heart should be studied with reference to endocarditis; renal elements in the urine might suggest embolus of the kidneys, while old or recent cerebral symptoms might point to cerebral embolus as well as atheroma of the vessels. He considers three conditions: 1. Embolus sufficiently large to obstruct the artery near its origin,—death would seem inevitable from this condition, because it causes a sudden loss of blood-supply to the jejunum, ileum, and ascending and transverse colon. 2. Embolus of the main trunk of the artery, but distal to the ileocecal and several of the intestinal branches; without operation death is to be expected from peritonitis as a result of gangrene and perforation; life may be saved by celiotomy and resection of the intestines. 3. If the embolus is small enough to find its way into one of the intestinal branches, no serious secondary result is to be apprehended, for the collateral circulation is very free. If embolus is diagnosed, operate, for neglect is sure death. If embolus is suspected, operate, for the dangers of an exploratory celiotomy in a hospital are less than the risk of expectant treatment.

¹ Boston Med. and Surg. Jour., Dec. 6, 1894.

Antipyrin as a Hemostatic is praised by Park¹ who says that this drug has distinct antiseptic properties comparing favorably in this respect with most of the anilin derivatives. He made experiments upon animals and found that antipyrin could be employed anywhere as an antiseptic styptic; and upon the bowel, the brain surface, or elsewhere it caused no unpleasant symptoms. He always keeps on hand a sterilized 5 per cent. solution to use by spray, by compress, or by injection. It will not contract vessels that are spurting blood, but it instantly checks oozing, and it is practically unirritating. [It has been found valuable in epistaxis.]

Wound of the Innominate Vein.—Ricard² communicated to the Society of Chirurgy a new method of treating this condition. While removing a large fibrosarcoma of the thyroid gland he was so unfortunate as to cut the jugular vein at its junction with the subclavian. As it was found quite impossible to apply a ligature that would have arrested the hemorrhage, Ricard sewed up the wound with Lembert sutures, occluded the opening, and permanently arrested the hemorrhage.

Injury of the Femoral Vein at Poupert's Ligament—Its Results and Treatment, is the title of an essay by Niebergall,³ injuries to the common femoral being the subject of the essay. The statement of Braune that because of the venous valves there is no collateral venous circulation is corroborated, but the author does not believe from this fact that sudden closure of the femoral vein necessarily leads to gangrene of the leg. The valves in the vein may be overcome by moderate arterial pressure, *i. e.*, from 180 to 200 mm., and an actual collateral circulation may be established. Therefore Niebergall opposes Braune's advice to ligate the artery as well as the vein for the prevention of gangrene. He says the artery should be left patent in order to supply the necessary blood-pressure. Clinical experience favors this opinion. In 25 cases in which the femoral vein was ligatured alone gangrene did not follow once. The simultaneous ligation of the artery and vein was followed by unfavorable results, for in 24 cases gangrene resulted 14 times. Niebergall concludes that ligation of the femoral vein may be performed without fear of ill consequences. It is desirable, however, if possible to close the opening into the vein by means of the lateral suture rather than occlude the vein by an encircling ligature. Compression is to be used only in exceptional cases. Lateral ligature is not advised. Forepressure may be applied, the clamp being left in position around the opening for 24 hours. In small wounds lateral suture is advisable if the vein is otherwise healthy and the wound is longitudinal in direction. In cases of malignant disease with infiltration of the vein-wall or extensive transverse wounds of the vein, the vein should be ligated and lateral suture should not be attempted. When ligature is employed both the distal and proximal ends must be tied

¹ Med. News, Dec. 15 and 22, 1894.

² L'Union Médicale, No. 17, 1894.

³ Deut. Zeit. f. Chir.; vol. xxxvii., No. 3-4.

and it may be found necessary to tie lateral branches. The limb is to be kept elevated after the operation.

Varicose Veins.—Stoker¹ presents a method of operating for superficial varicose veins. He is convinced that ligation of the veins is attended by certain risks. He has lost two patients from septicemia in whom he ligated the veins for varix. He has also found that when erysipelas is in a community such cases are likely to be attacked. He now divides the veins at selected points, removing about one-quarter of an inch of vein through a skin incision one-half inch long, and applying pressure by compresses and a bandage from the toes up, and using no sutures whatever. The patient remains in bed a week after the operation. Stoker holds that this method lessens the danger of infecting the vein and avoids the chance of a clot forming beneath the skin.

Winiwarter² advocates treating varicose veins of the leg by ligation of the internal saphenous vein. This is the method of Trendelenburg. Trendelenburg has shown that because the valves of the saphenous vein are insufficient, the blood circulating in this vein along with that in the femoral vein and the external and primitive iliaes forms a column that maintains high pressure in the veins of the leg when the patient is standing. Esmarch's tube is applied to the extremity of the thigh. Aseptic precautions are scrupulously observed, the internal saphenous vein is laid bare at the junction of the upper and middle third of the thigh, is freed from its surroundings, tied in two places and cut between the ligatures. The wound is closed with sutures and dressed antiseptically. The extremity is wrapped in cotton, bandaged firmly, and immobilized for ten days. The author calls attention to the fact that old varicose ulcers quickly heal under this plan of treatment. Occasionally the enlarged veins near the periphery are removed.

The treatment of varicose veins is considered by Robitzsch,³ who approves of the method of Landerer,—a bandage applied to the great saphenous vein in such a manner as to cure varicose veins of the legs. The apparatus is a sort of garter, the inner surface of which carries a spring that holds a cushion filled with water or glycerol. This garter is applied below the knee with a pad on the inner side of the leg in cases in which the varicosities only reach to the knee. The pad is placed over the great saphenous vein, which in this situation is prominent. When the disease extends higher up, the band must be placed above the knee, but the cushion should always lie upon the distended vein. The band must be applied so loosely that a finger can pass beneath it; the pad is not to constrict the entire leg, but to control the circulation in the vein alone. In cases in which the disease extends as high as the saphenous opening a bandage should be applied similar to that which is

¹ Dublin Jour. Med. Sci., March, 1895.

² Annales de la Soc. Méd. Ch. de Liege, No. 11, 1894.

³ Deutsch med. Woch., No. 34, 1893.

used in femoral hernia. One hundred cases have been treated in Landerer's clinic by this method, and the result has been eminently satisfactory ; 90 per cent. of the cases were cured of all discomfort due to varicose veins. [It will be seen from reflecting on this method by Landerer that the operation of Trendelenburg previously mentioned seeks to accomplish the same effect by operation, and thus avoids wearing a bandage.]

Leech-Extract.—Sahli¹ tells us that the head of the leech contains a substance that hinders coagulation of blood. By the use of an extract of leeches, or of powdered leeches, we may prevent the coagulation of blood. The active principle is unaffected by heat, is not poisonous, is soluble in water and rapidly appears in the urine. It was proved experimentally that the infusion of one leech's head would suffice to keep fluid 50 to 60 cm. of the blood. One hundred heads would act for a man of 150 pounds. It has been suggested that leech-extract would be valuable in thrombosis.

Multiple Aneurysm.—A very remarkable case of multiple aneurysm is recorded by Jessop,² in which one brachial and both external iliac arteries were ligated at different times. [This case is worthy of attention because of the fact that recorded cases of multiple aneurysm are not very numerous, and because it is accompanied by a postmortem examination.]

Aneurysm of the innominate and carotid arteries is discussed by Wyeth.³ After presenting two cases he tells us that the differential diagnosis between aneurysm of the innominate and arch of the aorta is extremely difficult. He has collected 22 cases in which without any treatment in aneurysm of the innominate there were 18 deaths and 4 spontaneous cures. Of these cures 3 remained well and 1 died three years later of rupture of another aneurysm. Out of 18 fatal cases 3 died of other diseases than aneurysm. Out of 14 cases of subclavian aneurysm treated by a restricted diet, rest in bed, and venesection, 5 died ; out of 6 cases treated by direct pressure with a bag of shot, or similar means, 3 were cured and 1 died. After a careful study, his own conclusion is that aneurysm of the root of the neck, especially of the innominate artery, whether it involve the right carotid or the right subclavian, should be treated by rest in bed, potassium iodid with restricted diet, and that in occasional cases even venesection should be employed. When aneurysms mount into the neck high enough to admit of compression, this should be made by means of a bag of shot. If no benefit is apparent after a short time, distal ligation should be considered.

Pye-Smith⁴ details an extremely interesting case in which death occurred because of traumatic aneurysm of an aberrant right subclavian artery. The patient fell from a height of about twenty-eight feet, lost consciousness for a few moments, but soon recovered it. He was suffering greatly from dyspnea and pain between the shoulders, but had no evidence of any fracture. He was

¹ Centrbl. f. inn. Med., June 2, 1894.

² Lancet, Nov. 17, 1894.

³ Am. Med.-Surg. Bull., Jan. 1, 1895.

⁴ Quarterly Med. Jour., April, 1895.

considerably collapsed, and on admission into the hospital lay upon his back, but required to have his shoulders raised. He had cough, with sharp pain in the upper part of his chest and pain in his back about the third dorsal vertebra. Swallowing was accompanied by sharp pain. No fracture could be found, no wound or bruise was discoverable, there was no irregularity of the spine, and no tenderness. There was tenderness over the second left intercostal space near the sternum and over the ninth space in the anterior axillary line on the same side. Auscultation showed that on the left side of the chest breath-sounds were almost entirely absent. On the right side breath-sounds and voice-sounds were exaggerated and accompanied with rales, and there was a pleuritic friction-sound near the angle of the scapula. There was a little expectoration of bright frothy blood. The heart-sounds were normal, the abdomen normal, the urine free from blood, the pulse 112, respiration 48, temperature 97.8°. The diagnosis was not clear, although Mr. Smith thought that the left bronchus must be occluded, and as the man had no artificial teeth, pipe, or other substance in his mouth at the time of the accident the conclusion was suggested that the bronchus was blocked by the pressure of a hematoma. For two or three days his condition improved. Ten days after admission he had a restless night from a troublesome cough, and from that time dyspnea continued to increase. Eighteen days after admission he was in great distress of breathing and very little air entered the right chest. He had no pulse at the right wrist, and on the right side Mr. Smith was unable to feel either the temporal or carotid beats, although all these vessels were felt pulsating on the left side. Attempts to use the laryngoscope produced great dyspnea and struggling. Laryngotomy was at once performed, a small dark blood-clot was ejected from the trachea, but on inserting a tracheotomy tube no air went through it. The trachea was then entered freely and the finger introduced. Mr. Smith found that the trachea was compressed from behind, its posterior wall being strongly pushed forward against the anterior wall. No foreign body was met with. By means of long, curved forceps introduced into the trachea and opened antero-posteriorly, the lumen of the trachea was restored and breathing reestablished. A piece of India-rubber was passed three or four inches down the trachea and tied in. The patient passed a fair night, but the next day vomited a half pint of blood. This occurred again an hour or so later, after which he gradually sunk and died that evening, twenty days after the accident. A post-mortem examination disclosed the existence of a traumatic aneurysm situated on an aberrant right subclavian artery in the posterior mediastinum which had ruptured into the esophagus. The right carotid artery crossed the trachea obliquely a short distance below the tracheotomy-wound, and was flattened by pressure forward of the trachea. The vessel sprang directly from the aorta, the innominate being absent, while the altered subclavian came from the arch of the aorta beyond the left subclavian, and took a deep course from left

to right between the spine and the esophagus. Just where it crossed the spine, at about the third or fourth dorsal vertebra, was a traumatic aneurysm that had a slit-like communication with the esophagus in front of it. The arteries appeared quite normal. Mr. Smith concludes from a study of this unique case, that a large proportion of our mistakes are due to our imperfect examination. He says that had he, on the patient's admission, noticed the absence of the right radial pulse, and followed up that observation by investigation of the other arteries, it can hardly be doubted that obstruction to the subclavian, together with freedom of the carotid, would have been recognized, and he might have been led to something like a correct diagnosis. He suggests that the case would be a good one for commentary at an examination in surgery, and might be summarized as follows: Injury from fall on the back from a height; absence of right radial pulse; dysphagia; dyspnea, with signs of obstruction of left bronchus; improvement for a week, then increased dysphagia; absence of right carotid pulse; increased dyspnea, culminating, on the eighteenth day, in suffocation, relieved by tracheotomy and a long trachea-tube; vomiting of blood; death on twentieth day. Postmortem: traumatic aneurysm of aberrant right subclavian artery in posterior mediastinum; pressure on left bronchus; right pleurisy; pressure on esophagus, trachea, and right carotid; ulceration into esophagus; hemorrhage.

GOITER.

The Surgical Treatment of Graves's Disease is discussed by Lemke,¹ who treated a series of cases of Graves's disease by operation, the results of which he published recently in a Berlin journal. All of the cases operated upon are alive with the exception of one woman who died of influenza three months after the operation. In every case the more important symptoms were relieved, the enlargement of the thyroid, the nervous excitement, the tremor, and the exophthalmos. The operation consisted in the partial removal of the gland. [Prof. Gersuny of Tübingen has recently recommended a method of treatment for enlarged thyroid which, because of his standing in the profession and the remarkable results reported, is worthy of trial and attention. He treated 150 cases of goiter by injections of iodoform. The solution employed was 1 part of iodoform and 7 parts each of olive oil and ether. The part of the thyroid to be injected he fixed firmly with the left hand and pressed it backward toward the spine. He introduced the needle of the syringe into the tumor, endeavoring to avoid the veins. When the needle is inserted into the growth he directs the patient to try and swallow. If the needle is within the thyroid when the patient attempts to swallow, it will move up and down. The injection is repeated every two, three, or five days, and from 3 to

¹ Med. Press and Circ., Jan. 30, 1895.

16 injections are required. In 90 per cent. of his cases a favorable result was obtained.]

Peterson¹ discusses the subject of operation in exophthalmic goiter and reports a case cured by operation. [The extirpation of the thyroid body for exophthalmic goiter is a comparatively recent procedure and was looked upon for some time with suspicion and disapprobation, but since the discovery of the effect of thyroid extract in the treatment of myxedema, and the fact that overdoses of this extract produce symptoms analogous to those of Graves's disease, the inference has become more than reasonable that this disease is not a pure neurosis, but is a condition due to the forcing into the system of some poisonous products by a diseased thyroid or else by the failure of the thyroid to properly remove some such toxic product from the organism. With such a basis of theory, operation becomes scientifically justifiable, and its results are in many instances gratifying, many cases being absolutely curable by thyroidectomy. How this is brought about is not absolutely certain. It may, and probably does do it, by diminishing the activity of the gland-substance. The operations for Graves's disease are not entirely safe. James J. Putnam, in his paper on thyroidectomy for Graves's disease, records a case of death following this operation, and calls attention to the belief he holds that the dangers of thyroidectomy in Graves's disease are greater than previous reports would indicate.]

Lancereaux² discusses sudden death after goiter-operations due to disturbance of the nervous system, and comments upon the great value of morphin in counteracting such conditions. In one of Lancereaux's cases the temperature rose very rapidly just before death. [This observation would co-ordinate with the view of Warren that during the operation toxic substance from the thyroid might be sucked directly into the circulation and be responsible for the death. It is a well-known and long recognized fact that in operating on ordinary goiters sudden death is not unusual. Many causes have been sought to explain this, the usual view being that it is due to direct irritation of the sympathetic nerve of the pneumogastric, or of the recurrent laryngeal. Wolff holds that the large amounts of mucus raised from the stomach, induced by the anesthetic, frequently cause sudden death. This is not uncommon, Wolff holds, because the air-tube is very much narrowed and resembles the shaft of a sword in outline. At the present day, before operating on a goiter of ordinary size, we should try the effects of thyroid extract and remember that Burns³ reports that of 12 patients thus treated, 9 were either cured or very much improved. In each of these cases use was made of an extract of raw thyroid gland from the sheep or calf, administered in sandwiches in doses of from 5 to 10 g., repeated at intervals of from two to eight days. In operating upon goiter, Kocher usually does not use an

¹ Boston Med. and Surg. Jour., vol. cxxxi., p. 319. ² La Semaine Médicale, Jan., 1894.

³ La Semaine Médicale, 1894, xvi.

anesthetic, but sometimes employs a 2 per cent. solution of cocain. An anesthetic engorges the veins, increases bleeding, and by producing vomiting tends to cause reactionary hemorrhage; besides this, pulmonary and renal complications may follow. The retention of consciousness enables the surgeon to avoid damage to the recurrent laryngeal nerve by telling the patient from time to time to speak. This precaution is especially valuable while tying the inferior thyroid artery.]

The Origin of Goiter is discussed by Mitchell.¹ He calls attention to the fact that goiter is produced under the same circumstances as malaria, and that early in the present century Clark brought forth the theory that the disease owed its origin to the dampness of marshy districts. In the valley of Assam, where the climate is exceedingly hot and damp, malarial fever and goiter are equally common. In one of the outpost stations there is a large supply of soft drinking water, and a residence here of three or four months is sufficient to produce a goiter. A striking instance occurred in 1874, when a body of troops encamped on marshy ground near Dikang, and in spite of the water being very soft, suffered, almost without exception, from swelling of the glands. Mitchell suggests that in view of the disease being so frequently associated with malarial fever, we may suppose that it is due to a similar cause, and as malaria is due to the corpuscle of Lavan, it seems probable that goiter may owe its origin to similar microorganisms, the germs of which are introduced into the system from the air, or by the use of water containing them.

LYMPHATIC GLANDS.

Adenitis.—Brault² states that in inguinal adenitis complicating syphilis, incision should be performed; that in adenitis following chaneroid the bubo should be evacuated and injected with a 5 per cent. silver nitrate solution; that in acute tubercular lymphangitis all infected glands should be at once excised. Raboul³ advised the use of camphor naphthol in the treatment of tubercular adenitis. About 5vj of the drug are injected.

Edema and Elephantiasis Following Extirpation of the Lymphatic Glands.—Riedel⁴ reports a case of a boy aged twelve, in whom edema of the arm and hand resulted from removal of lymphatic glands from the axilla three years previously. A second case was a man of thirty, who had the inguinal glands excised, and who in about two years developed some degree of elephantiasis of the skin of both thighs and the lower part of the trunk. A third case was in a man of thirty, who developed elephantiasis one and a half years after excision of the left inguinal glands. In both the second and third cases the development of the elephantiasis was associated with repeated attacks of dermatitis. [This opens the question of whether or not complete

¹ Provincial Med. Jour., Jan. 1, 1895.

² Centralbl. für Chir., No. 2, 1894.

³ Lyon Médical, No. 10, 1894.

⁴ Arch. f. klin. Chir., vol. xlvii.

extirpation of glands is always desirable. In tubercular and cancerous glands the danger of the lesion renders such extirpation imperatively necessary, but in other conditions the possibility of a persistent edema and an elephantiasis should cause us, if possible, to retain some glandular elements. It seems probable that in some cases of carcinoma of the breast with axillary involvement, in which swelling of the arm follows operation, the swelling is a persistent edema from gland-insufficiency rather than from venous pressure.]

Method of Removal of Tuberculous Lymphatic Glands of the Neck.—Dollinger¹ proposes operation through an incision made in the hairy portion of the neck, some distance from the affected glands. The incision is made in shaven skin, so that the scar will be covered by the return of the hair. Through this incision the glands can be seized with forceps, loosened with elevators, scissors, or knife, and drawn out altogether. This incision heals well and prevents the hideous deformity occasionally following the ordinary operation. It is a sort of subcutaneous extirpation. [The essential of the operation for the removal of tubercular glands is thoroughness. The deformity resulting from the scar is not to be considered in comparison with the disastrous results that will ensue from leaving tubercular foci undisturbed. The only method to gain access with safety to all tubercular foci is by means of a large incision, and we believe in tubercular glands of the neck which are extensive that the incision should reach practically from the mastoid to the sterno-clavicular joint.]

GANGRENE.

Spontaneous Gangrene following Typhoid Fever is dealt with by Mettler,² who says that among the predisposing causes of this complication are lowered vitality of the body and mental depression. Of 81 cases in Keen's list, 56 were in males, 25 in females. Of 9 patients in his list whose sex was reported, 6 were men, 3 were women. Therefore spontaneous gangrene is most common in the male sex. Out of 10 of his collected cases obstruction was discovered in the lower extremities, usually the left, once in the left carotid, once in the left cheek, once in the mesenteric vessels. The peripheral distribution of the trouble led the earlier investigators to attribute it to weakened heart-action and slackened blood-current, but it seems certainly in some instances to be due to the toxic action of the products of the bacillus of typhoid fever. Mettler is convinced that the production of arterial thrombosis and subsequent gangrene is due in the majority of cases to an endarteritis assisted by various mechanic factors.

Amputation in Gangrene.—Williams reports two cases of rapidly-spreading gangrene of the upper and lower extremities with amputation and recovery.³ The first case was that of a man who fell and dislocated his

¹ *Centralbl. für Chir.*, Sept., 1894.

² *N. Y. Med. Jour.*, March 9, 1895.

³ *Brit. Med. Jour.*, Feb. 2, 1895.

shoulder, the dislocation not being discovered until the following morning, when it was reduced by manipulation. Within a few hours the hand became cold, shriveled, dark, and absolutely deprived of feeling. On admission to the hospital three days after the injury the hand was black and cold, and at intervals up the arm and forearm and on the pectoral muscle and in the axilla were large, purplish-black spots covered with bullæ containing black fluid. Pulsation could be felt high up in the axilla, but not in the radial or brachial artery. The patient refused amputation, but after a few days the condition of general gangrene became so marked that he consented. Amputation was performed at the level of the insertion of the deltoid and the artery was found firmly plugged from the axilla down to the hand. The veins were uninjured. He made a good recovery. The second case resulted from a crush between car-bumpers, in which the leg was in an active state of putrefaction up to three inches above the knee and the general condition was almost desperate; the temperature was 104°, F. Amputation was performed high up in the upper third of the thigh, followed by a rapid recovery. Both the popliteal artery and vein were found ruptured just below Hunter's canal. In his remarks upon these cases, Williams states that he has never before known gangrene to follow luxation at the shoulder. In the second case it is remarkable that both bone and skin escaped injury while artery and vein ruptured. Very little blood had escaped, although the tear in the artery was fully half an inch long, while the vein was torn open for 2½ inches. Jones¹ records a case of acute emphysematous gangrene in which amputation at the shoulder was followed by recovery. The man had slipped and fractured his right forearm, and at the same time had inflicted a slight wound on the inner side about 2½ inches above the styloid process, which wound communicated with the ulna. The wound was cleansed but not enlarged, dressed with iodoform, and placed in a splint. The next day there was great pain and swelling, the splint was reapplied, and the wound examined. On the next day, that is, the second day after his admission, there was deep-seated aching, the hand was very pale and cold, and did not bleed on puncture. The splint was at once removed and the arm placed in hot bran. The next day at noon the hand was swollen, cold, and dark gray in color. The wound was puffed and tense, with pale granulations, but clean and sweet. The forearm and lower part of arm were of a dusky red color, varied here and there with patches of purplish-black discoloration, with a few small blebs. The affected parts pitted on pressure, and were generally emphysematous. Two hours after this amputation was performed from the shoulder, but so high up had the gangrene extended that there was practically no attempt at the formation of flaps. There was very little bleeding from the stump, which was studded with dark-colored patches. The wound was swabbed all over with pure liquid phenol, which was inserted also between the muscles at the front of the chest and

¹ Provincial Med. Jour., August 1, 1894.

between those around the scapula. The operation lasted but a few minutes, and was not followed by any alarming collapse. In commenting on this case, Jones says that surgeons are generally agreed that the chances of recovery after amputation largely depend upon an intervening healthy area between the disease and the site of incision. This case appears to have been the most unfavorable for operation yet on record. The rapid invasion of the disease, its extent, the inevitable delay of operation, rendered the prognosis extremely bad. The part played by the phenol in the treatment may mean much or little.

A case of gangrene of the whole of the right leg following acute rheumatism is reported by Kanellis,¹ the patient being a married, hysteric, and anemic woman, who was attacked with acute rheumatism. On the twenty-sixth day there appeared as high as the upper third of the right leg a red flush all over the skin of the leg and foot; this turned to a bluish color and was accompanied by pain and coldness of the whole limb. The pain was agonizing, especially at night. At no time during the sickness was there any murmur in the heart. When a line of demarcation appeared, the leg was amputated and the patient recovered.

Severeanu² says :—"About ten years ago I had to amputate the legs of two individuals, one after the other, for gangrene of the foot, and on each occasion the flaps mortified. Upon this the idea struck me that in a similar case it would be advantageous to free, by means of a sound, the branches of the popliteal artery whenever the pulse was only perceptible high up. The first time I adopted this plan was in a man of fifty, who was attacked by gangrene of the foot following cardiac embolism. Pulsation in the artery could only be felt at a high level; amputation was absolutely essential, and in order that it should be attended with a fair chance of success, the site of operation should be in the inferior extremity of the thigh. In spite of this I performed amputation of the leg at a selected site, having prepared beforehand some gum-elastic sounds, thoroughly aseptized, which I succeeded in introducing into the mouths of the arteries, pushing them up and down until blood began to flow. When I withdrew the sounds the stream of blood expelled some cylindrical clots, and the circulation became reestablished. In consequence of this procedure the flaps did not mortify on this occasion, and union took place by first intention. Ever since, in similar cases, I have always performed arterial catheterization with the best results."

DISEASES OF THE NERVOUS SYSTEM.

Diseases of the Spinal Cord.—Thorburn³ tells us that from 1814 to 1885 he finds but 50 operations recorded as having been undertaken for in-

¹ *Progres Médical*, vol. xx., No. 30, p. 58, 1894.

² *Provincial Med. Jour.*, Oct. 1, 1894, extract from the *Polytechnique Médicale*.

³ *Brit. Med. Jour.*, No. 1747, 1894.

juries of the spinal cord. Chipault's figures give a mortality of 48 per cent., but if the cases since 1885 be reckoned, a mortality of 37 per cent.; even the earlier figures contrast favorably with cases in which no operation was undertaken, of which cases Gurlt gives a death-rate of 80 per cent. In tuberculosis the true operative fatality is only 20 per cent. From the reports of MacEwen, Horsley, Lane, Thorburn, Abbe, Chipault, and Schede, the cases numbering 70, we find there are 12 deaths, a mortality of 17.1 per cent. The cause of death in a majority of cases was shock; hemorrhage was rarely serious, and sepsis was practically absent. The author summarizes his views as follows: In compound fractures, in fractures of the spinous processes and lamina (with injury of the cord), in simple fracture, dislocations of the bodies of the vertebræ when hemorrhage is probable, operate; but in all cases of this nature in which injury is above the limit of the first lumbar vertebra; laminectomy will not avail. Thorburn¹ also shows that life is in some cases prolonged to a remarkable degree, even in apparently hopeless cases. For instance, a patient of Hilton's lived fourteen years with a paraplegia due to fracture of the fifth, sixth, and seventh cervical vertebræ. It is not rare to meet with hematonyelia due to slight crushing. The early symptoms are severe but rapidly pass away, hence it is improper to assign occasional good results to the benefits of operation. In 41 cases of unilateral dislocation, 35 were successfully reduced, but in the majority of these cases there was no symptom of cord-injury at all, and in not a case was there complete crush. In unilateral cervical dislocations, attempts at reduction should be made at as early a period as possible after the injury. They can do no harm and may be successful. He records 5 double luxations in 2 of which reduction was impossible. In the other 3 the deformity was apparently corrected by attempts at reduction, but recurred at once in spite of the use of a plaster jacket. If the cord is crushed, recovery is hopeless and reduction will not cure or even materially benefit the symptoms. When the cauda equina is the seat of injury the prognosis is decidedly better. Manipulations in the cervical region are highly dangerous and are unjustifiable in injuries of the atlas and the axis. Manipulation should be limited to the unilateral cervical dislocations, and the bilateral dislocations in the lower dorsal or lumbar region. In regard to laminectomy, in the published records of 200 cases, and in the personal experience of 7 cases, he has found no positive evidence that benefit was derived from the operation itself. He says, however, that laminectomy is useful and justifiable: 1. In compound fractures when the removal of fragments of bone, etc., is necessary. 2. In injuries of the laminae and spinous processes in which there is probably not complete cord-crush. 3. When the symptoms are due purely to hemorrhage. 4. When pachymeningitis follows an injury even a long time after the injury. 5. If the cauda equina is compressed.

He does not use the plaster jacket before the fifth week.

¹ Brit. Med. Jour., Oct. 27, 1894.

Excision of Spina Bifida is discussed by Herrick.¹ He observed a case in which the sac had ruptured at birth or before birth. There was a continuous discharge of fluid without any apparent deleterious influence on the child. He performed a preliminary aspiration, removing 3 ounces of fluid. A median incision was then made into the nearly emptied cyst. The nerve-filaments on the upper surface of the sac were dissected off and pushed into the canal through the foramen. The redundant sac was cut away down to the level of the skin. The edges of the wound were approximated with silkworm sutures placed very close together, and the dressings of aristol and gauze were not changed for five days. Primary union was obtained, and the stitches were removed on the seventh day; a complete cure apparently followed. Van Hook,² in discussing the treatment of spina bifida, opposes absolutely the injection of iodine. He says the advantages of this method are its ease of application and a moderately good percentage of cures, but the objections outnumber the advantages: 1. The method does not permit the operator to dispose of nerve-elements, but compels him to obliterate the sac by the formation of a scar. 2. The irritant fluid may cause immediate death. 3. The contents of the spinal canal will not be sufficiently protected by the shrivelled sac,—the mere obliteration of the sac should not be the sole object of treatment. He sets forth the following advantages as following the open method: 1. The operator may return the nerve-elements uninjured to the spinal canal. 2. The membranes can be closed accurately in order to satisfactorily protect the spinal cord. 3. The spinal canal can be closed by plastic methods, rendering recurrence practically impossible. Furthermore, the statistics of the two methods are slightly favorable to the open method. Hildebrand's statistics show 66 per cent. of recoveries following injection, and 73.5 per cent. of recoveries following the open method. He adopts Bayer's conclusions as to the proper period for operation: 1. The operation for sacral and lumbosacral spina bifida should be undertaken at once in all those cases with ruptured sacs, that do not show paralysis, and are not complicated by other malformations, except club-foot. 2. It is to be done in cases that show paralysis as soon as the child is well developed. 3. In cases in which the sac is unruptured and covered by normal skin, the period of infancy should not be selected for operation, although operation must not be postponed too long for fear of injuries. The methods of operating are: 1. Simple excision of the sac with suture of the remainder of the membranes and of the skin. 2. The same operation with the additional precaution of suturing the muscles or fascia over the defect. 3. The osteoplastic or chondroplastic methods. 4. The combination of excision of the sac, suture, plastic operations upon the muscles, fascia, and bones.

Nerve-Suturing.—Willard³ presented in the Mütter Lectures of 1894

¹ Quarterly Med. Jour., April, 1894; from N. Y. Med. Jour., Dec. 30, 1893.

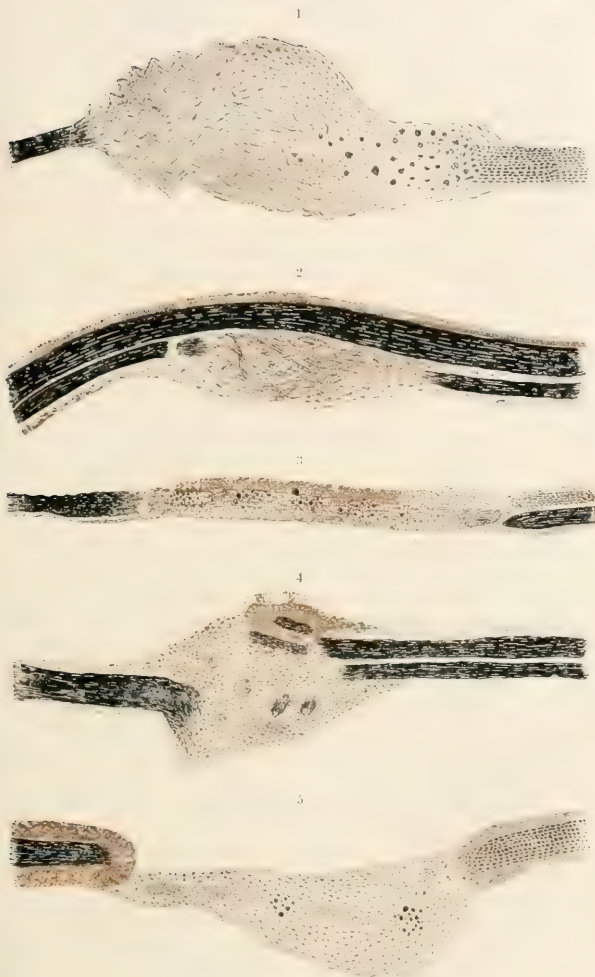
² North Am. Practitioner, vol. vi., No. 5.

³ Med. News, Oct. 6, 1894.

the subject of nerve-suturing, neurorrhaphy, and nerve-grafting, reviewing the literature upon the subject, and analyzing the histories of 117 cases of primary suture and 130 cases of secondary suture. He finds that nerve-injuries are more common in the male and in the upper extremities. That in primary cases union has taken place at as great a distance as 2 inches, in the secondary cases at as great a distance as 4 inches. Sensation has returned at a period varying in primary suture between one day and one and a half years, and secondary suture between one day and two years. Motion has returned as early as one day after the suture and as late as one year in primary sutures, while in secondary suture it may be postponed for three years. Willard's conclusions are as follows: Fear of tetanus is groundless. Errors in reports of successful cases are commonly due to the substitution of function by other nerves. Failure may occur in some cases, though the sutured nerve-ends unite well because of secondary degeneration of the motor-cells of the cord. Immediate suture gives a good prognosis for the restoration of both sensation and motion. Clean end-to-end suture should be practised after carefully freeing the ends of the nerve of cicatricial tissue for a considerable distance. The best material to sew with is chromicized catgut, passed by means of a small, round needle through the body and sheath of the nerve, two sutures being crossed at right angles, the part to be placed at rest and the nerve relaxed. Good results are possible when the ends of the nerve-trunk are widely separated by suturing one end to the freshened surface of the adjacent nerve or muscle. Secondary suture should be attempted even years after an accident. If there is great loss of nerve-substance, grafting the nerve from a recently amputated human limb or from a young animal gives a better result than splicing or splitting the ends, and decalcified bone-tubes are of little avail, because they are absorbed with such rapidity. It may require months to restore function, the sensation returning first. In spite of the fact that the distal portion of the divided nerve degenerates rapidly, as does a graft interposed between the ends, transmission of function is possible, and regeneration may occur both as regards sensation and motion. (Plate 5) shows some result of Willard's experiment.

Removal of the Gasserian Ganglion for Facial Neuralgia.—This subject is discussed in a valuable article by Richardson and Walton.¹ This branch of surgery is of so recent a date, and the number of reported cases so small, that each case should be reported; the dangers and difficulties are not as yet fully understood, nor has the best method of operating been established. We have to choose between the method of Rose (trephining at the base), and the lateral operation (opening through the temporal bone) by the so-called Krause-Hartley method, or the method of Horsley. As Keen has shown, the operation involves working in the dark through a small opening, which adds to the difficulty of thorough removal and the dangers of the operation,

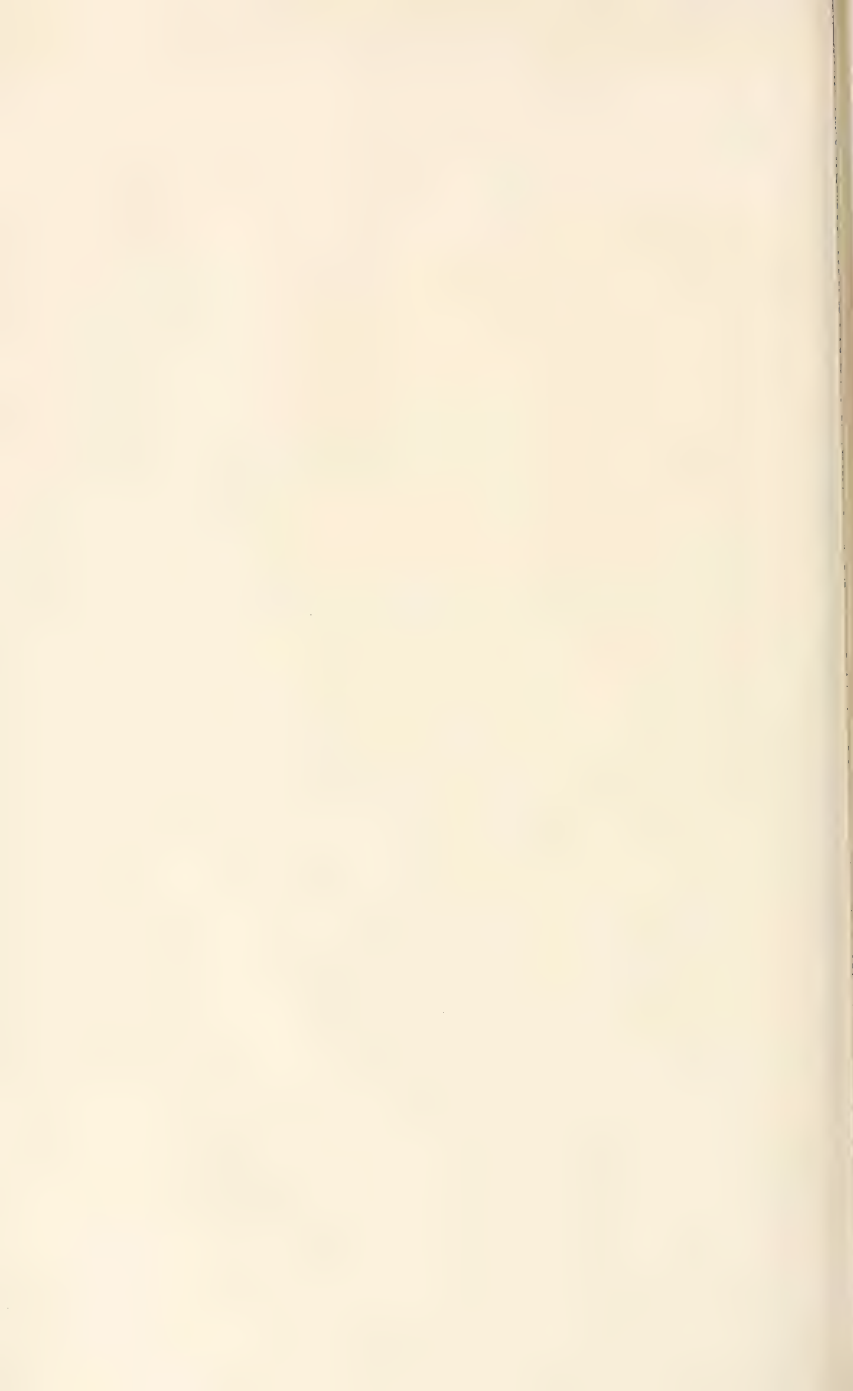
¹ Boston Med. and Surg. Jour., Nov. 1, 1894.



Nerve-suturing (Neurorrhaphy).

- FIG. 1.—Nerve-resection; suture; left nerve. (Experiment No. I.)
 FIG. 2.—Nerve-resection; suture; right nerve. (Experiment No. I.)
 FIG. 3.—Nerve-anastomosis; left nerve. (Experiment No. VII.)
 FIG. 4.—Nerve-splicing; right nerve. (Experiment No. VII.)
 FIG. 5.—Nerve flap splicing; right nerve. (Experiment No. XIV.)

(Intern. Med. Mag., April, 1894.)



because many important structures are contiguous to the area of operation. The internal carotid artery, cavernous sinus, ocular nerves, and the middle meningeal artery can hardly be expected to escape injury by either method. The case recorded by Richardson was successful, who adds that the long course of the fifth nerve through unyielding canals and around bony prominences, with the fact that it is exposed (through supplying the teeth) as no other nerve of the body, to external influences, adds materially to the usual causes of neuralgia. If careful dental treatment fails in cases of neuralgia of the second and third nerves, the final resort is removal. Operations on the accessible portions of these branches prove only temporarily beneficial, and it is a question if it be unjustifiable to advise the deeper operations at once in cases sufficiently clear to justify operations at all; but when we consider the ease with which the superficial branches may be removed, and with the usual complete relief, though only for a year or so, we should perform this operation first, especially in old and feeble patients, and reserve the deep extracranial operations and the removal of the ganglion until they are absolutely the last resort. It is true that peripheral operations are almost invariably followed by recurrence of pain, but relief may last for a year or more. When the pain recurs advise the deep operation, cutting the second and third divisions at the base of the skull, and in many of these cases the pain does not return, or, even if it does recur, can be controlled by medical means; but in those cases in which, in spite of the deep operation, the pain recurs with its old-time violence, the Gasserian ganglion must be removed. Keen tells us that if we can lessen mortality, or if we can demonstrate that no recurrence takes place, operation upon the Gasserian ganglion should be the first recommended, otherwise not. Richardson then describes Rose's method, and next the Krause-Hartley operation, and discusses the advantages of and the objections to each. [Fig. 47, from Krause, exhibits resection of the ganglion by his osteoplastic method.] Richardson alludes to the valuable measurements of the skull which have been made by Dr. Taylor¹ in regard to the relations of the Gasserian ganglion. In Taylor's paper he summarizes a study of the interior of 20 skulls to establish the anatomic and surgical relations of intracranial neurectomy of the fifth nerve and removal of the Gasserian ganglion. He shows that it is impossible to make definite section of the first division without doing great damage to the cavernous sinus, the third, the fourth, and the sixth nerves, and the carotid artery. We must be content simply with cutting the attachments and removing or destroying the ganglion, and with it the second and third divisions as they pass through the foramen rotundum and foramen ovale. The middle meningeal artery, as it enters the cranium through the foramen spinosum, must frequently be wounded or torn through. For this reason it is often wise to ligate and deliberately cut it as a better proceeding than to run the

¹ Phila. Polyclinic, 1894, No. 3.

risk of tearing it as it passes through the foramen. If it is torn at the foramen spinosum our only means of controlling the hemorrhage is by packing the foramen or the ligation of the external carotid artery below the origin of the internal maxillary artery. In going over these skulls Dr. Taylor found great inequality between the measurements of the two sides. His measurements are as follows: The distance between the center of the foramen spinosum and that of the foramen ovale varies from 3 to 13 mm.; from the center of the foramen ovale to that of the foramen rotundum varies from 8 to 18 mm.; from the center of the foramen spinosum to that of the

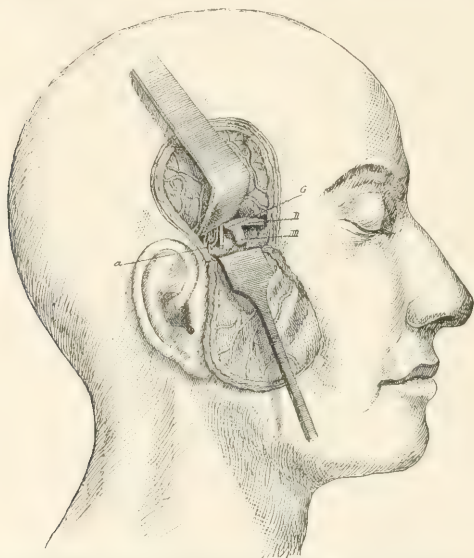


Fig. 47.—Removal of Gasserian Ganglion: *a*, middle meningeal artery; *II*, ophthalmic division; *III*, submaxillary division; *G*, ganglion (Krause, Archiv für klinische Chirurgie).

foramen rotundum varies from 11 to 24 mm.; the center of the foramen ovale is anterior to that of the foramen spinosum from 3 to 9 mm.; the center of the foramen ovale is internal to that of the foramen spinosum from 3 to 9 mm.; the center of the foramen rotundum is anterior to that of the foramen spinosum from 13 to 20 mm.; the center of the foramen rotundum is internal to that of the foramen spinosum from 6 to 16 mm.; the distance from the center of the foramen rotundum to that of the fossa for the Gasserian ganglion varies from 11 to 23 mm.; the center of the foramen ovale is distant from that of the fossa or groove for the ganglion from 3 to 13 mm.;

the width of the bridge of bone between the foramen ovale and the carotid canal varies from 1 to 13 mm. The diameters of the foramina have been determined as follows: The spinosum varies from 1 to 4 mm.; the ovale from 4 to 9 mm.; the rotundum from 1 to 4 mm.

Intracranial Surgery.—Bramwell¹ contributes a most valuable and instructive paper upon this subject. In regard to intracranial tumors he says that in a few cases brilliant results may be obtained by surgical interference, but that the cases in which they can be successfully removed are very rare. A consideration of the conditions present shows us why this must necessarily be the case: 1. In a certain number of cases the tumor is not characterized by any positive symptoms on which a diagnosis might be based. 2. In some cases in which the symptoms distinctly show the presence of intracranial tumor there are no localizing symptoms whatever. 3. In a few cases in which there are localizing symptoms, these give an erroneous impression as to the position of the tumor. 4. In many cases in which the exact position of the tumor is clearly made out by definite symptoms, successful operation is either impossible or uncalled for. Thus we have (*a*) those cases in which the position of the tumor precludes operative interference, for instance, tumors at the base, or involving the medulla, pons, basal ganglia, the deeper parts of the centrum ovale and corpus callosum, and a large proportion of cases in which the tumor is seated in the cerebellum. (*b*) Those in which the tumor is extensive, and infiltrates a large area of brain-tissue. (*c*) Those in which multiple tumors exist. (*d*) Those in which the tumor is malignant. (*e*) Those in which the tumor is complicated by lesions in other organs that contraindicate operation,—*e.g.*, in some cases in tubercular tumor of the cerebrum tubercles are also present in the lungs, and in some syphilitic cases the vessels of the brain are so extensively diseased that an operation would be extremely hazardous. (*f*) Those in which the symptoms are relieved by treatment and an operation is thus rendered unnecessary. In 77 out of 82 cases of intracranial tumor which Bramwell has seen during life, operative interference was contraindicated. Of the 5 remaining cases the success upon operation he thinks would have been extremely doubtful, and in the remaining 3 cases an operation might possibly have been attended with success. Bramwell says that although it appears there are comparatively few cases in which the surgeon can hope to successfully remove an intracranial tumor, he agrees with Prof. Annandale in thinking that trephining of the skull as a palliative remedy is often most desirable. This operation may relieve symptoms in cases in which there is a great increase of intracranial pressure and in which the drug-treatment has failed. In some cases with intense headache, death occurs suddenly, as the result of the mere severity of the pain and sudden inhibition of the action of the heart. Trephining may much relieve this persistent headache. Again, the intracranial pressure may induce

¹ Edinburgh Med. Jour., June, 1894.

epileptic seizures or failure of respiration. It is by no means easy to establish a continuous drain of cerebrospinal fluid from a trephine-opening, but the opening of the dura does materially reduce pressure, and it is unquestionably true that this does relieve the headache and other symptoms that are the source of so much suffering, and frequently the cause of death. It is further to be remembered that in many cases intense optic neuritis exists, and if permitted to continue passes on to atrophy and blindness. Now it has been conclusively shown that in some cases in which trephining has been performed, both for tumor and abscess, the optic neuritis has speedily disappeared, probably because of the relief of intracranial pressure. Bramwell further asserts that in many cases of lead-poisoning in which brain-symptoms are prominent, trephining will relieve optic neuritis and prevent optic atrophy. Furthermore, Victor Horsley has shown that the operation of trephining and the removal of a portion only of the cerebral tumor produces a retarding influence upon the growth of the remaining portion of the tumor. Whether this be true or not, the operation in many cases makes the life of the patient more comfortable and bearable. In cases in which the diagnosis of the seat of the tumor is uncertain, and those in which the symptoms are not rapidly relieved by potassium iodid and mercury, the disease is bound to prove fatal, often rapidly fatal, and under such circumstances if the locality of the tumor can be even approximated,—for instance, if we can even determine that it is in the right hemisphere, and there is a reasonable probability that it can be reached, operative procedure is justifiable. In considering epilepsy, Bramwell divides it into the following groups: 1. Traumatic epilepsy, in which there is a scar or depression on the surface of the skull and in which the epileptic discharge begins in the portion of gray matter immediately beneath the seat of external injury,—in these cases operation is clearly indicated. 2. Cases of traumatic epilepsy in which the depression or scar is situated on the surface of the skull and in which localized spasms or an aura show that the epileptic discharge begins in a definite area of the brain-cortex, but in which this area does not immediately underlie the position of the external injury ;—in those cases operation is less likely to be successful, but when treatment by drugs proves futile, operation is called for. The surgeon should first trephine over the position of the scar or the depression ; if no source of irritation is found upon the cortex in that situation, a second portion of bone should be removed from over the discharging center. 3. Cases of traumatic epilepsy in which a scar or depression represents the position of the old injury of the skull, but in which the epileptic fit begins with a general widespread discharge and not with a local spasm or a definite aura ;—in these cases trephining should be done at the seat of injury, but the operation is really experimental and is rarely successful. 4. Cases of idiopathic epilepsy, excluding cases the result of a coarse lesion and in which the epilepsy is symptomatic, and cases in which the epileptic fits always commence with a localized

spasm or with a definite aura that is constant in character, and that definitely indicates the area of gray matter which is first discharged ;—in these cases if drug-treatment fails, trephining should always be performed,—the mode of commencement of the spasm or the character of the aura being the guide to the situation of the discharging lesion ; the localized spasm is a far more certain guide than is sensory disturbance ; after trephining the skull in these cases, the affected portion of gray matter should be cut out. 5. Cases of idiopathic epilepsy in which there is no sign that epileptic discharge commences in a localized area of the brain. In these cases the results of operation are very unsatisfactory. Bramwell says if drug-treatment has been thoroughly tried and failed, the disease is likely to continue and the mental deterioration to become worse rather than the reverse ; that the operation is attended with risk to life ; that it may perhaps give some temporary relief ; but that it is not likely to produce any permanent benefits,—in short, that the operation in these cases is purely experimental. But there are many cases in which the question of an experimental operation should be considered, as has been shown by Annandale. It is often impossible to say without opening the skull whether there is anything that can be removed or reached. In cases of this kind, when the condition of the patient is desperate, when life is hardly worth the living, we are warranted in risking a good deal, but trephining does not risk a great deal, because the operation is comparatively safe.

In discussing cerebral and cerebellar abscess, Bramwell speaks of the brilliant successes obtained in some cases of temporosphenoidal abscess, and these clearly show that when there is any reason to suspect abscess of the brain, trephining should be performed, and the brain-tissue explored in the hope of finding pus. In cases in which the diagnosis is uncertain, operation adds but little to the risk. He states his position as follows : Given definite and distinct cerebral symptoms with middle-ear disease and a purulent discharge from the ear, the operation of trephining is warranted even when the physician is uncertain as to whether the cerebral symptoms are clearly indicative of abscess or not, because in some cases it is absolutely impossible to distinguish between abscess associated with cerebritis on the one hand, and meningitis on the other. The local ear-disease should be treated by operation and the temporosphenoidal lobe should be exposed and explored. In regard to trephining for tubercular meningitis, Bramwell holds that the operation may be useful and should certainly be tried experimentally in tubercular cases, because tubercular peritonitis has in many instances been cured by opening the abdomen. Tubercular meningitis is almost invariably fatal, and any plan of treatment that holds out even the possibility of cure deserves a trial. The operation of Keen of tapping the ventricles, if it is performed at all, should be performed in the early stages ; it cannot be expected to effect a cure when the disease is far advanced, although a late tapping of the ventricles to relieve intracranial pressure may be useful as a palliative measure. In regard to trephining in

cerebral hemorrhage, Bramwell says he has seen several cases in which the relief of the rapidly increasing intracranial pressure might possibly, for a time at least, have warded off the fatal result, but he doubts if successful operative cases are numerous. He is speaking, of course, entirely of non-traumatic hemorrhage, in which the hemorrhage is in the vast majority of instances intracerebral.

Prof. Annandale¹ in an able and original review of intracranial surgery advocates the use of exploratory incision for purposes of diagnosis in obscure brain-conditions, and says an examination is frequently required: 1. In intracranial inflammation and suppuration. 2. In hemorrhages, traumatic or nontraumatic. 3. In epilepsy of traumatic origin, developmental epilepsy, idiopathic and syphilitic epilepsy with localizing symptoms, and which have proved obdurate to antisiphilitic treatment. 4. Intracranial tumors. 5. Microcephalus and hydrocephalus;—in hydrocephalus, however, operative treatment is very unsatisfactory. Earlier operation should be practised. 6. Mental conditions resulting from traumatism and general paralysis. Even an exploratory operation is unjustifiable in ordinary insanity unless definite symptomatic indications are discovered. Annandale concludes that no new surgical procedures should be in force unless they are found upon careful consideration and a thorough study of all new facts, pathologic, clinical, histologic, and physiologic.

Concussion of the Brain.—Polis² makes an extended study of concussion of the brain, and arrives at the conclusion that concussion, due to a single blow or to repeated blows, is accompanied by the same effects upon the nerve-centers. If differences are manifest at the moment of the blow they can be readily explained and simply confirm this general law; the clinical condition, is identical in the two cases. The analogy is visible even in the minutest detail, that there is nothing to be added to the bulbar symptoms. Violent concussion produces great rapidity of heart-action. Nerve-centers under the influence of anemia suffer the same changes as under the influence of concussions.

The Causes of Traumatic Epilepsy.—Le Dentu³ sets these forth as follows: 1. Bone-fragments from fractured skull. 2. Outgrowths of bone due to tumor. 3. Meningeal cicatrices, following laceration of the membranes by bone-fragments. 4. Incipient chronic meningitis, which ends in sclerosis of the membranes. 5. Cysts arising from intracranial hemorrhages occurring at the point of fracture. 6. Arteriovenous aneurysm. In operating for traumatic epilepsy it is not enough to remove a piece of bone, but if the lesion is not discovered on trephining, the dura must be opened to permit of inspection, or even incision of the cortex of the brain. It is to be borne in mind that incision of the cortex is likely to be followed by a more or less permanent paralysis.

¹ Edinburgh Med. Jour., April, 1894.

² Rev. de Chirurgie, 1894, Nos. 7 and 8.

³ La Presse Médicale, June 9, 1894.

Septic Infection within the Cranium is the title of a very able paper by Park,¹ who gives a list of the bacteria most commonly found in brain-abscesses and intracranial suppuration. These include the streptococcus pyogenes, the staphylococcus aureus, albus and citreus, the diplococcus of pneumonia, the bacillus pyocyaneus, the bacillus pyogenes fetidus (identical with the colon-bacillus), the bacillus tuberculosis, certain saprophytic organisms, the staphylococcus salivarius of Biondi, and the bacillus meningitis purulenta, which may also prove to be identical with the colon bacillus. He says occasionally other organisms may be found, like the leptothrix and the oidium albicans, but their presence is probably accidental. The path of infection may be along blood-vessels, lymph-vessels, nerve-sheaths, or the prolongations of the membranes that surround the brain and extend outside the cavity of the cranium. Infection beginning in the nose may spread to the ear by means of the eustachian tube, and to the frontal and ethmoidal sinuses by open channels, and from either of these situations to the brain. A middle-ear filled with granulations is an excellent incubator chamber for bacteria. The path of infection along the optic nerve by means of the subdural and subarachnoid space is easily followed. The most easily traced affections are those that follow middle-ear disease. Infection may produce a local involvement of the dura with extradural abscess, and as a result adhesion may occur that prevents a general leptomeningitis. If such adhesions fail in extradural abscess, leptomeningitis is almost certain to arise. It may result from septic thrombosis alone, it may be brought about by regurgitation of the blood, the sinuses having no valves. Infection may travel readily along the sheaths of the arteries. It is always to be remembered that traumatic conditions strongly predispose to infection. The most common of all the routes of infection is by the middle ear. The slower and more chronic the ear-disease the greater the danger, and the more acute the less likely is it to spread to the interior of the skull because of the previously healthy condition of the parts, which fill with exudate and create a barrier to bacteria. It is not accident that determines whether the abscess following ear-disease is found in the cerebrum or the cerebellum. If the roof of the tympanum is most involved it ulcerates, perforation occurs there, and the middle fossa of the skull is infected. The most common spot for perforation is the posterior part of the roof of the tympanum toward the mastoid antrum or into the sigmoid groove. In the former case if abscess arises it will be found in the temporo-sphenoidal lobe, and in the latter case in the cerebellum. He summarizes the mode of healing of the brain-abscess, the symptoms, general and local, and the methods of diagnosis.

Cerebral Compression.—A most important paper is that of Horsley² upon the mode of death in cerebral compression and the means of prevention. He says that in all cerebral hemorrhages or cases of cerebral tumors, de-

¹ Chicago Med. Rec., Feb., 1895.

² Quarterly Med. Jour., 1894, ii., No. 4.

pressed fracture of the skull, as well as cases of sudden and violent concussion, especially when the force is applied in the occipital region, death tends to occur from respiratory failure and not from failure of the heart, as is usually supposed. The result of these accidents is the rise of pressure within the skull, and this produces a slowing of the respiratory movements, and eventually their arrest. Three common causes of increased intracranial pressure have been subjected to surgical interference, namely, cerebral tumor, hemorrhage, and areas of inflammation. In each of these cases sudden death is likely to occur from arrest of respiration, and this is certainly fatal, unless the skull be opened and the pressure relieved. In several cases in which respiratory failure happened in the course of operations, artificial respiration was instantly commenced and the skull was opened freely and quickly over the presumed area of compression while respiration was being carried on. In every case the moment the skull was freely opened and the pressure relieved, normal respiration returned, the movements being at first somewhat shallow, but later assuming their customary range. Horsley calls attention to the great benefit derived from hot irrigations of the head in removing operative shock and restoring activity of the respiratory function. Ice-bags should be abandoned after head-injuries. He sums up his views as follows: Of all of the lower nerve-centers that are necessary to organic life, the respiratory center is most sensitive to pressure and to shocks. When death is about to result in cases of intracranial pressure, artificial respiration should be resorted to and the skull opened freely. In cases of sudden shock, artificial respiration should be carried out and hot irrigation be used upon the head.

Lumbar Puncture for the Removal of Cerebrospinal Fluid.—Browning¹ advocates this method, and thinks it is practically without danger. It enables us to remove from 1 to 1½ ounces of the fluid in one short sitting. In internal hydrocephalus the relief is but temporary; in tuberculous meningitis it is not worth the trouble; and in the closed or sacculated forms it does harm. It is valuable as a diagnostic means in suspected meningeal hemorrhage, but as an evidence of pressure it is worth nothing. It may give relief in brain-tumors uncomplicated by hydrocephalus; it may be tried as a substitute for trephining in dementia, and in certain spinal troubles as a means of applying remedies to the spinal meninges. In conclusion he states that while the operation may be admissible in all cases of brain-pressure, there is no positive indication whatever for its employment, except for the purposes of diagnosis.

Methods of Closing the Skull following Compound Comminuted Fractures are considered by Bretano,² who says that the most important osteoplastic methods are: 1. Heteroplasty with celluloid or some similar foreign body. 2. Heteroplasty with decalcified bone-plates. 3. Müller-König's method, or autoplasty. 4. Autoplasty by planting separate bone-

¹ Med. News, July 21, 1894.

² Deutsche Med. Woch., May 17, 1894.

fragments. The first two methods have only been used when the skull-defect was caused by operation, and have been entirely superseded by the method of temporary resection. They may, however, be useful after trephining for epilepsy. Bony union may be obtained by employing decalcified bone, which undoubtedly stimulates the production of fresh bone. There can be no doubt that bone-defects in healthy bone can be closed by means of bone fragments, whether they are or are not connected with the periosteum. In some cases the Müller-König method is the only means we can employ, as, for instance, in recent injuries in which the fragments are lost, in resections of the skull for diseases of the mind, in congenital defects, such as meningocele and encephalocele, and in old defects however produced. Bretano prefers, however, in all cases when the necessary material is at hand, and especially in recent fractures, autoplasty, with implantation. If brain-symptoms follow soon after implantation, the fragments should be removed at once, but if brain-symptoms follow months after implantation, the skull should be reopened by a temporary resection.

Basal Drainage for Hydrocephalus.—Parkin¹ records another successful case. He exposed the cerebellum about one inch below the superior curved line of the occiput and $\frac{1}{2}$ inch to the right of the middle line, and by gouging away the bone and incising the dura, he passed a probe into the subarachnoid space, raised the cerebellum, and permitted the flow of a considerable amount of cerebrospinal fluid. A horsehair drain was inserted into the subarachnoid space and the wound was sutured.²

The Surgical Treatment of Idiocy and Microcephalus.—Jacobi's³ conclusion is that in the face of so many deaths and so few results, this operation does not promise good, does not effect what is intended, and does not even enlarge the cranial cavity. [A conservative view of the operation of linear craniotomy would be about as follows: That it can be employed in individuals under eight years of age, but never in people over this age, and should only be applied to patients who are very vigorous and strong. The operations should be done only on one side at a time, but the incision should be as long as possible over the forehead and the occipital bone, and can even be made T-shaped by a cut toward the ear. A few patients improve, and this improvement is possibly sufficient to make the operation occasionally worth doing, but it is impossible to promise much either intellectually or physically. Cuytitz tells us that it has long been recognized that a narrow and deep palatine vault is a sign of mental inferiority. The majority of idiots have high arched palates. Cuytitz explains the arching as follows: The brain tends to develop transversely, but sometimes meets with resistance in the parietal region that crowds it back. This pressure is transmitted by

¹ Lancet, No. 3664.

² This method of operating was fully described in the Lancet for July 1, 1893.

³ Archives of Pediatrics, June, 1894.

the zygomatic, temporal, and malar processes and pushes together the alveolar bodies of the superior maxillary bones. The bringing together of the alveolar bodies in the original palate is, therefore, only the expression of an abnormal effort which in the psychic life reveals itself by degeneracy. (Manual of Mental Medicine, by Dr. E. Régis.) It seems possible that idiots with high, arched palates are the most suitable subjects for craniotomy; they are idiots because there is or has been demonstrable opposition to the expansion of the brain.]

Chiene's Lines for Localizing Brain-centers are as follows:¹—

Shave the head and divide the line (Fig. 48) from the glabella (G) to the occipital protuberance (O) into a middle point (M), a $\frac{3}{4}$ point (T) and a $\frac{7}{8}$ point (S). The external angular process (E) and the root of the zygoma (P) are

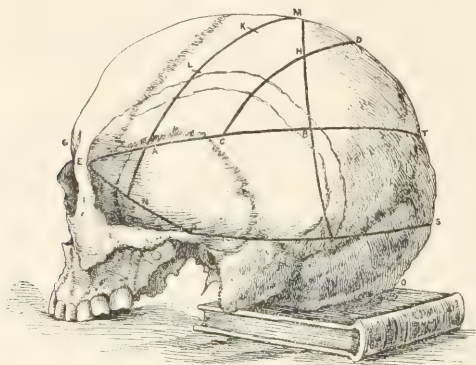


Fig. 48.—Chiene's lines for localizing brain areas: M D C A, Rolandic or motor area; A, ant. branch of middle meningeal and bifurcation of fissure of Sylvius; A C, horizontal part of Sylvian fissure; the highest part of the lateral sinus touches P S at R; M A, precentral sulcus; I, beginning of inferior frontal sulcus; K, beginning of superior frontal sulcus; M B C, contains the supramarginal convolution; B, angular gyrus (Edinburgh Med. Jour.).

then found. Join EP, PS, and ET. Bisect EP and PS at N and K. Bisect AB at C. Diam., CD = AM. The pentagon A C B R P Y covers the temporo-sphenoidal lobe except its apex, which is slightly in front of N.

Punctured Wounds of the Brain.—Berger² discusses this subject, holding that the first treatment should be absolute rest, and that surgical intervention is unjustifiable when there are no distinctly localizing symptoms. Verneuil advises the same plan.

[We dissent from this plan of inactivity in punctured wounds. The head should be shaved, the parts aseptized, and all foreign bodies on the outside removed. Foreign bodies and bone—fragments driven into the brain—should be extracted, depressed bone elevated, and the cavity in the brain

¹ Edinburgh Med. Jour., June, 1894.

² La Tribune Médicale, March 29, 1894.

disinfected. Hemorrhage should be arrested by hot water and the ligature, the dura sutured, drainage introduced, the flap sutured, and dressings applied.]

VENEREAL DISEASES.

Extragenital Syphilitic Infection.—Krefting¹ reports 539 cases, three-fourths of which had been infected from drinking vessels. Fifty per cent. of cases had lip-chancres, and 20 per cent. throat chancres, and in only 3½ per cent. was the lesion on the tongue. [Such statistics emphasize a truth not sufficiently known to the general public, that any public drinking vessel is a menace, and should only be employed after a thorough rinsing out. Every person should learn to drink from a glass or cup so as not to touch the mucous membrane of the lips to the vessel.]

Excision of the Initial Lesion.—King² advocates excision of the initial lesion of syphilis, and claims that early excision will abort the disease, that excision of an unhealed chancre will moderate subsequent secondary manifestations, and that excision is the cleanest and best way of treating the lesion. [Every now and then some one resurrects this procedure as something new. If any fact in science has been clearly demonstrated it is that syphilis is a constitutional malady by the time the initial lesion appears, and this is proved by our inability to make autoinoculations in even the most recent cases. Excision for purposes of prevention is entirely futile, and it is highly probable that the reported successes are examples either of erroneous diagnosis or of ill-marked and transitory secondaries. The possibility of erroneous diagnosis in the early stages must be admitted to be very great, and there is no way of proving that in the alleged successes the extirpated area was an initial lesion and not a chaneroid. The reason why excision is useless as a preventive measure is clearly shown by Taylor. This distinguished authority says: ³ “The point deserving of attention in the first case is the extremely early and far-extending involvement of the blood-vessels; although the primary sore in the first case is but of a few days’ duration and very small, and under the microscope is of such limited and circumscribed extent, the blood-vessels are very extensively surrounded by cell-investment at a considerable distance from the ulcer. The microscope shows how deeply rooted syphilis is at the beginning of the sore, it having propagated itself along the perivascular lymph-spaces, and how futile it is, as experience has already shown, to attempt to stay syphilis by excising the primary sore. Apparently, judging from the appearance of the vessels in these cases, their involvement begins before the appearance of the sore.” The theory that excision of the chancre will modify the course of the disease by limiting the amount of poison entering the system is worthy of attention, but when we

¹ Archiv. fur Dermatol. und Syph., Bd. xxvi., Heft. 2. ² Med. News, Aug. 23, 1894.

³ Med. Rec., July 1, 1891.

reflect on the persistence of the disease even after early ablation, the conclusion is unavoidable that germs capable of multiplication must have entered the system. Excision would be valuable if the symptoms arose only from toxins taken into the system, but would be of little value if symptoms arose from the absorption of microorganisms capable of multiplication. The excision of an ordinary chancre simply to bring about healing seems an unjustifiably harsh measure when we consider how comparatively easily the healing can, as a rule, be brought about.]

The Treatment of Phagedenic Chancroid is considered by Arnozan,¹ who employs local hot baths from four to six times a day, each bath lasting ten minutes and the temperature of the water being 40° C. This hot solution may be water, 1:100 phenol, or 1:1000 mercuric chlorid solution. Iodoform is applied in the intervals between baths. Hot baths are discontinued when granulations appear and spreading ceases. Duband cleans the chancroid with a 1:2000 solution of mercuric chlorid, applies a solution of cocain, touches the ulcer with a hot iron or a solution of zinc chlorid (10 per cent.), washes again with mercuric chlorid solution, dries, dusts with salol and iodoform, and dresses with bits of cotton kept soaked in the mercurial solution and frequently changed. [A point of great importance in these cases is attention to the constitutional condition, for the general health as a rule is in a most dilapidated state. Iron, quinin, strychnin, nourishing foods, and stimulants comprise the usual agents employed. Fournier² tells us, when other means fail, to apply iodoform locally in considerable quantities and to cover it with cotton and rubber tissue. Fournier says if iodoform fails, caustics must be used, but they, too, often fail.] Heat for chancroids is advocated by Arnozan.³ It has been applied somewhat differently by Lorand. Water held in a copper reservoir is kept by a gas jet at a temperature of 50° C. A rubber pipe carries water from this reservoir to a coil of lead tube, from which it is conducted by another rubber pipe. If the water in the reservoir is 50° the water in the coil will be 41°, below which it must not fall. Undermined edges of the ulcers are clipped away and the sores are dressed with cotton-wool soaked in warm water. A layer of moist wool is applied around the penis, and over this the lead-coil, through which water is kept flowing; a layer of wet wool covers the tubing and all the dressings are covered with a layer of gutta-percha tissue. The dressing is changed three times a day. Water is furnished in abundance by having two pipes pass to the reservoir, one pipe carrying hot water and the other cold. The waste is caught in a bucket. In most cases the ulcers become clean and healthy in two days.

The Treatment of Chancroidal Buboës.—Rullier⁴ advocates Fontan's treatment of buboës, the method being as follows:—Asepticize the skin; punc-

¹ Jour. de Méd. de Bordeaux, No. 8, 1894.

² La Tribune Médicale, July 7, 1894.

³ Med. Record, May 19, 1894.

⁴ Archives de Méd. et de Pharmac. Milit., No. 3, 1895.

ture and evacuate the pus, inject mercuric chlorid (1 : 1000), allow it to run out, and then inject vaselin liquefied with mercuric chlorid. Cure is accomplished in from six to seven days. [This treatment will be quite futile in cases in which the skin is badly infiltrated, but in other cases it is sometimes productive of excellent results and enables us to avoid the performance of a cutting operation, which leaves a slow-healing wound and a bad scar.]

The Hypodermic Use of Mercury in the Treatment of Syphilis is discussed in a clinical report by Horwitz,¹ his conclusions being:—Hypodermic medication will not abort the disease, and should not be adopted as routine treatment. It rarely produces abscesses or pyalism. In suitable cases properly employed it is a most valuable method. If mercuric chlorid is used gr. $\frac{1}{4}$ should be given at each injection, unless the patient has been previously given mercury by the mouth, in which case gr. $\frac{1}{8}$ should be the dose. Injections of mercuric chlorid are to be used when a rapid impression is desirable or necessary (*e. g.*, in lesions of the face, eye, or nervous system), and in cases of relapsing syphilis this may prove curative when other methods fail. In severe secondary syphilis, when there is a strong tendency to relapses during a two-year course of treatment, it is well to wind up with a weekly hypodermic of gray oil for six weeks, and after this with a three-months' course of potassium iodid.

[Horwitz's views are founded on a large practical experience, are sound, sensible, and conservative, and in marked contrast with some of the literature upon this subject. Several papers have recently appeared in which attempts have been made to show that syphilis can be cured by a comparatively few hypodermic injections. To assume that a few injections will in a brief period cure syphilis is folly, forgetting the natural history of the disease and disregarding the plainest lessons of common sense and experience. J. William White does not think that the hypodermic method offers advantages that justify its adoption as a systematic plan; it occasionally produces local trouble, can not be carried out by the patient, and encourages insufficient treatment, those "short heroic courses" which Hutchinson shows are likely to be followed by the gravest tertiary lesions. "The claim that by a few injections the time of treatment can be measured by months or even by weeks, instead of by years, would seem, as Mauriac has said, to involve the idea that mercury given hypodermically acquires some new and powerful curative property that it does not possess if given in other ways." (Prof. J. Wm. White in *Morrow's System of Genito-Urinary Diseases, Syphilis, and Dermatology.*)]

Serum Therapy in Syphilis is discussed by Gilbert and Fournier,² who outline the observations of Fenlard, Nazza, and others, and present the results of some new experiments in the treatment of syphilis by the serum of immune animals and men. They commenced using serum from the blood of

¹ Proceedings Phila. Co. Med. Society, vol. xv.

² Sem. Méd., April 27, 1895.

a patient with a positive history of old syphilis and suffering from locomotor ataxia, and from the blood of another patient who had had gummata and was under treatment for obstruction of the superior cava. The subject of experiment was a patient who had had no previous treatment, who had two infecting chancres upon the penis, double buboes, nocturnal headache, aching in bones and joints, and a general maculopapular eruption. He was given 304 c.c. of serum in twenty days, by injection, the average dose being 35 c.c. During this time the chancres healed, the eruption almost disappeared, the pains were relieved, and the general condition was much improved. The eruption was earliest influenced in the neighborhood of the injection. The new method of the authors is to insert beneath the skin of certain animals blood-serum, chancres, and papules obtained from patients laboring under primary and secondary syphilis. The plan is to thus increase the natural antagonism of the animal's blood to the syphilitic poison. A she-goat was given 180 g. of blood in fifteen days and in 10 injections. A dog was given 170 g. of blood in 8 injections in forty-five days. A she-goat had 9 chancres placed under her skin in two months. A dog in four months received 4 chancres and 2 papules, and 120 g. of blood in 4 injections (60 g. being thrown into the peritoneal cavity). Seventeen patients were treated with this new serum, and 7 took ordinary treatment at the same time. All improved. In the 10 cases treated by serum only, results were contradictory, some cases appearing to be much improved, others seeming to be uninfluenced. Further observations are being conducted.

Injections of Ichthyol for Gonorrhoea.—Colosanti¹ advises a watery solution containing from 2 to 5 per cent. of the drug. He claims that ichthyol destroys the specific organisms, that it is antiphlogistic and resolvent, that it causes no pain, relieves ardor urinae, prevents chordee, and leaves no tendency to stricture. In catarrh of the bladder he washes out the viscus with a solution of ichthyol from $\frac{1}{2}$ to 1 per cent. strength. [We might cry, Verily, here is the long-sought specific, but previous experience has taught us to be wary, and to await a thorough trial. The author's claims are so positively favorable that we approve of trial.]

DISEASES OF THE BLADDER AND URETHRA.

Ichthyol in Urethritis and Cystitis.—Villetti² strongly advises the use of ichthyol in acute urethritis, injecting a 2 per cent. aqueous solution from five to six times daily, and gradually increasing the strength to 5 per cent. As the patient improves, he diminishes the number of injections to one in the morning and one in the evening. In acute cystitis he applies 30 per cent. ichthyol-ointment to allay pain, and after the acute period employs

¹ *Rif. Méd.*, Jan. 12, 1894.

² Report of Inst. of Exp. Pharm. of the R. Univ. of Rome, 1894.

irrigation, injecting about one quart of a $\frac{1}{2}$ per cent. aqueous solution of ichthyol twice a day for a few days and then once a day. In chronic cystitis he injects, once daily, a 1 per cent. solution of ichthyol.

Cystitis is treated by Colin¹ by instillations of mercuric chlorid. The solutions are of the strength of from 1 : 500 to 1 : 1000. At first an injection is given every other day, but later every day, the strength of the solutions being gradually increased. From 5 to 10 g. should be injected into the bladder, and 10 or 15 drops are deposited in the posterior urethra and about the vesical neck. [Guyon has proved that irrigation of the bladder with a considerable quantity of mercuric chlorid, 1 : 4000, causes much pain, but that a strength of 1 : 500 can be employed without discomfort if but a small quantity is injected.]

Witzack² employs lactic acid in tubercular cystitis, and uses it with lactate of cocain to prevent pain. He takes 2 parts of lactate of cocain and 10 parts each of distilled water and lactic acid, and after having emptied and washed out the bladder, applies 15 drops of the fluid to the ulcerated spot. Vigneron³ injects antipyrin into the bladder and follows this injection by the usual local treatment. The antipyrin acts like cocain and prevents pain from the necessary manipulation. In a nondilated bladder he injects from 10 to 20 g. of a 4 per cent. solution ten minutes before beginning the local treatment. In a dilated bladder he first carries out the local treatment and then at once injects from 60 to 120 g. of a $\frac{1}{2}$ to 1 per cent. solution, and allows it to remain. Lavaux⁴ says that several drugs given by the stomach have a genuine value in cystitis. Sodium bicarbonate (30 to 90 gr.) is the best remedy if the cystitis is due to an irritant (as cantharides), but it does actual harm in ammoniacal urines. Sodium borate does good in large doses, and a 30-grain dose acts like an alkali. Boric acid, benzoic acid, and sodium benzoate are better borne by the stomach, but are not much more efficient than is borax. Salol is very efficient; it is a powerful remedy and may cause trouble; from 30 gr. to 5ij are given daily, but the latter quantity is too large an amount. If kidney-trouble exists salol can be given, but only in small amounts. The essence of yellow sandal often greatly benefits gonorrhoeal cystitis, but some cases it makes worse, and it is irritant to the kidneys. About 5j is a safe dose. Doses of 10 drops of turpentine even in acute cystitis may be beneficial. The stomach tolerates buchu better than it does uva ursi, tar, or eucalyptus. If mineral waters are employed use only feeble ones, as those of Evaux, although acute cases may be improved by Vichy or Vals. Pain is best relieved by lavage without the catheter, a warm 2 per cent. boric-acid solution being used, with cocain, and antisepsis of the lower genito-urinary tract being secured. [This method of allaying pain is pre-

¹ Thèse de Paris, 74 pp., 1894.

² Jour. de Méd. de Paris.

³ Ann. des Mal. des Org. Genito-urin., 1893.

⁴ La Chirurg. Contempor. des Org. Genito-urin., 1894, No. 5.

ferable to the administration of morphin hypodermically, chloral by the mouth, or opium with belladonna or gelsemium by suppository.]

Abortive Treatment of Gonorrhea is the title of an article by Viceconti,¹ who approves of Giuard's treatment (frequent washing out with a weak solution of potassium permanganate). In inflammation of the anterior urethra 5 or 6 g. of fluid is allowed to run in from a fountain syringe, and is at once voided. Not more than half a liter should be used at one sitting. Solutions are used of a strength of from 1:1000 to 1:5000. Two washings are employed on the first, second, and fourth day. There should be no washing on the third day, and no washing on the fifth, sixth, seventh, and eighth days.

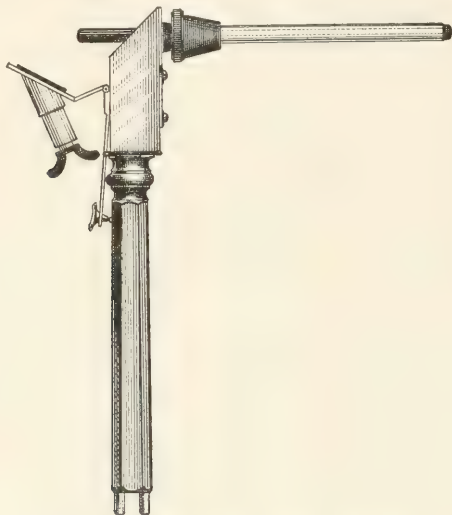


Fig. 49.—Baum Electric Endoscope (North Am. Practitioner).

[This treatment is easily applied by having a reservoir at a height of five or six feet. About one quart of fluid is employed and it should be warm. Irrigation by this method can be used not only to abort the disease, but also throughout the progress of an acute case.]

Urethroscopy.—Leopold Caspar² presents the subject of the Limits and Value of Urethroscopy, concluding: That the best urethroscopes are constructed on the principle of external illumination; that in many cases urethroscopy is important for diagnosis and treatment and no other method can replace it; because of certain mechanic obstacles and anatomic and

¹ *Rif. Méd.*, Feb. 9, 1895. ² *Annales des Mal. des Organ. Genito-urin.*, Sept., 1894.

physiologic conditions, urethroscopy is retained within positive limits, beyond which the "interpretation of the image becomes impossible;" urethroscopy of the posterior urethra is almost never justifiable.¹ [Urethroscopy, has unquestionably a positive value in many cases for diagnosis or treatment. Many chronic urethral conditions in which persistent discharge is a feature, go for months or years uncured, until the patient is given local treatment through an endoscope. The endoscope is not to be used in acute or subacute inflammations, nor in widespread inflammation, but it is applied for circumscribed pathologic conditions. Fenger will not examine a patient with the endoscope for a gonorrheal discharge so long as the urine is cloudy and contains gonor-

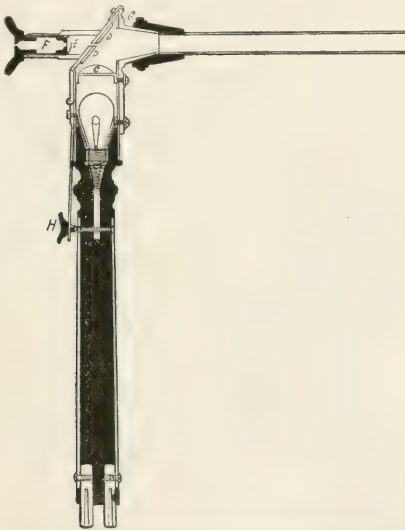


Fig. 50.—Baum Electric Endoscope (North Am. Practitioner).

rhoeal filaments. Before introducing the endoscope find the caliber of the patient's urethra and determine its degree of hyperesthesia by the introduction of a bougie-à-boule. It may be found necessary to dilate with steel sounds before the urethra is of sufficient caliber and sufficiently insensitive to permit of the usefulness of the endoscope being utilized and appreciated. Fig. 49 shows a form of instrument which is held to be practically of high value.]

The Operative Treatment of Ruptured Urethra is discussed by Deane'sly,² who tells us that rupture occurs almost invariably either in the region of the bulb or in the membranous urethra. Rupture in front of the

¹ Otis's abstract in *Int. Med. Mag.*

² *Practitioner*, July, 1894.

triangular ligament produces the classic symptoms. Rupture behind the triangular ligament, as occurs in fractured pelvis, causes extravasation between the bladder and the pubes. When considerable urine collects in the prevesical space, and the surgeon introduces a catheter, the catheter may enter this space, and as urine flows out the operator is likely to believe that the instrument is in the bladder. This conviction will be deepened by the movability of the instrument from side to side and by the employment of rectal touch. Deanesly holds that in all cases of rupture of the bulbous urethra, and in all cases when a blow upon the perineum has produced free bleeding from the urethra, this tube should be exposed for examination whether a catheter passes or not. The catheter may prevent extravasation but can not prevent stricture-formation. If the urethra has been divided, sew the ends together with silkworm gut, horsehair, or silver wire. After resection of the bruised portion the sutures include the entire thickness of the urethra except the mucous membrane, and the operator is careful that the edge of the membrane does not get folded into the wound. The perineal wound can be left open or can be sutured, the sutures including the bulbocavernous muscle. In partial ruptures, with intact fibrous sheath, make a longitudinal incision, explore, resect damaged tissue, free the ends from the corpora cavernosa and stitch them together. Pass a catheter (rubber, No. 8 or 9 English) and tie it in.

Suprapubic Cystotomy.—Tailhefer² advocates making an attempt to secure primary union after suprapubic cystotomy by immediate suture of the bladder. Primary sutures lessen the chance of urinary infiltration even though they tear out, for they will hold for at least three days, during which time inflammatory adhesions form. One layer of sutures passes between the muscular and mucous coats, and a second layer of Czerny sutures is added for reinforcement. The wound is drained at the lower angle, a catheter is tied in, or is introduced at regular intervals, or else the patient is directed to urinate frequently. He considers hematuria before operation a contraindication to suture, because of the tendency of blood-clot to obstruct the catheter. [The attempt to secure primary union should be more often made. Most of the French and German surgeons use sutures. Union is often obtained, and if it fails we are no worse off than before. Tailhefer would have it we are better off. Guyon and Albert are strong advocates of the bladder-suture. Cut the bladder above the pubes rather than back of it. If we are operating for stone, do not drag a large calculus through a small bladder wound, as the inevitable bruising and laceration will prevent the stitches from holding.]

Lithotomy.—The comparative safety of suprapubic lithotomy, of lateral lithotomy, and of litholapaxy in young males is considered by Barling.¹ Of 44 cases of suprapubic lithotomy under ten years of age, 10 died; of 28 between ten and twenty years of age, 5 died: Total, 72 cases with 15

¹ *Gaz. Hebdom. de Méd. et de Chir.*, Aug. 12, 1894.

² *British Med. Jour.*, May 5, 1895.

deaths. Deducting 3 deaths in which either crushing or lateral lithotomy had been attempted, we have 69 cases with 12 deaths, a mortality of 17.4 per cent. Of 39 cases of lateral lithotomy under ten years of age, 2 died. Of 20 cases of lateral lithotomy between ten and twenty years of age, none died. Total: 59 cases and 2 deaths. To be added to this is 1 death from suprapubic operation, after an unfinished lateral operation, making 60 cases with three deaths, a mortality of 5 per cent. Of 43 cases of litholapaxy under ten years, 1 died. Of 16 cases between ten and twenty years, none died. Add 2 deaths from suprapubic operation after an uncompleted litholapaxy, and we have a total of 61 cases with 3 deaths, a mortality of 5 per cent. The causes of death in the suprapubic operation were: Shock, 4; infiltration of urine, 2; kidney-troubles, 3; pyemia, 1; septicemia, 1; bronchitis, 1; pneumonia, 1. [The conclusion is irresistible that in young males both the operation of crushing and the lateral operation are far safer than is the suprapubic method. The crushing operation is one requiring great delicacy of manipulation, and an inexperienced surgeon had probably better cut than crush,



Fig. 51.—Senn's silver tube (Medical News, June 23, 1894).

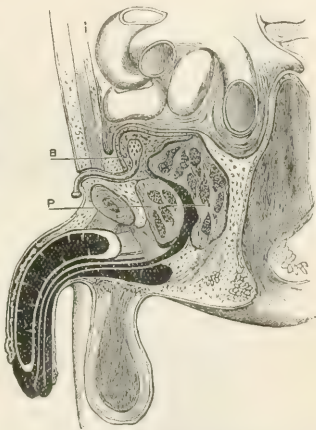


Fig. 52.—Senn's tube applied. The instrument does not press upon the sensitive neck of the bladder (Medical News, June 23, 1894).

but an experienced operator in selected cases will obtain most admirable results from litholapaxy. In children the suprapubic operation should be reserved for large stones, and litholapaxy should be restricted to cases in which the calculus is small, single, and tolerably soft. The comparative safety of Bigelow's operation as performed in children by a skilled surgeon is shown by Freyer's statistics,¹ 164 cases in children with only 2 deaths, 0.5 per cent. mortality.]

Senn² describes a self-retaining drainage tube for use after suprapubic cystotomy for chronic cystitis and prostatic obstruction. This instrument maintains permanent drainage. (Figs. 51, 52).

¹ Brit. Med. Jour., vol. i., 1894.

² Med. News, June 23, 1894.

Forbes¹ in a very original article sums up the results of experiments upon 184 calculi, made for the purpose of determining accurately their resistance to the force of crushing, and concludes that there is a pronounced

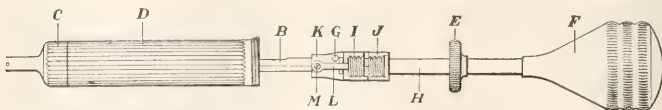


Fig. 53.—Forbes's lithotrite (Med. News).

decrease in crushing resistance relative to size and weight as they grow larger. Forbes's son has devised a new lithotrite, with a resistance-scale upon the handle, so that in future it will be possible to record resistance at

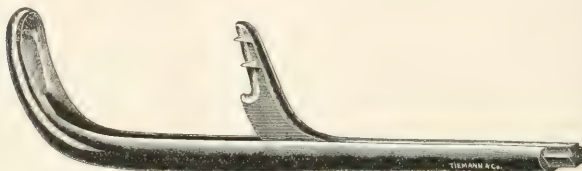


Fig. 54.—Forbes's lithotrite (Med. News).

the time of operation. This lithotrite is extremely powerful, the vesical end consisting of a male blade sliding in a female blade and held within it by an undercut and angled slot, which prevents the male blade from being strained out of the groove during crushing; the greater the strain the tighter is the male blade held within the female. The long axis of the shaft is straight to within 2 inches of the curve, at which point it is angled 5° to meet the curve. This mechanism has great advantages: It renders introduction through the urethra easy; it strengthens the female jaw by supporting it higher up; it enables a large stone to be grasped by the comparatively short female

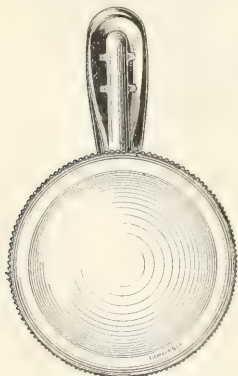


Fig. 55.—Forbes's lithotrite (Tiemann).



Fig. 56.—Forbes's lithotrite (Med. News).

blade—if crushing is impossible,—and the angle between the shaft and the long axis of the female blade is the same as if the shaft were straight

¹ Med. News, June 23, 1894.

to the curve; the anterior surface of the female blade is concave; this concavity prevents slipping of the stone lower down during crushing and guides it to a point where the crushing force is strongest. The female blade is much longer than the male, all debris is expelled, impaction is impossible, and the wall of the bladder is protected from pinching; the posterior surface of the male blade is wedge-shaped at an angle of 60° , so that it easily penetrates the calculus; this blade is crossed by two ridges, which prevent broken stone from flying; the screw-mechanism is of the interrupted screw variety. [This instrument is undoubtedly a most valuable tool; it is convenient, reliable, and very powerful, and can safely be subjected to a pressure of 500 lbs. Figs. 53-56 show the Forbes lithotrite.]

Rupture of the Bladder.—Srein¹ maintains that surgical interference is the only method of treatment for bladder rupture, and to succeed it must be early. In intraperitoneal rupture do a median celiotomy, suture the bladder, and, if necessary, drain the peritoneal cavity. In extraperitoneal rupture make an incision above the pubes or perform symphysiotomy. Do not open the peritoneal cavity unless in doubt as to visceral injury, and suture the bladder rather than drain. It is not necessary to make a perineal cut for draining, as the hypogastric incision permits it, and a perineal incision is only made when there is urinary infiltration, or when the rupture is near the vesical neck. If the tear cannot be sutured, drain the bladder by a catheter and siphon tube. [The suture of the bladder in extraperitoneal rupture is rather a recent suggestion, and we feel sure should, if possible, be adopted.]

Suprapubic Cystotomy for Stone.—Meisenbach² advocates the transverse incision of Trendelenburg, without the aid of rectal inflation or bladder-injection. The patient is placed in the Trendelenburg position, and an incision is made over the pubic bone, the cut being slightly convex downward, and reaching from one inguinal canal to the other. The insertion of the recti is exposed, the wound is retracted, a sound is introduced into the bladder, the insertions of the recti are cut across, the pyramidalis also sectioned, the prevesical space is cleared as usual, the point of the sound is felt for, and the bladder is anchored and incised vertically. He does not suture the bladder or muscles. [There can be no doubt that the transverse incision is easy of execution and affords a large exposure of bladder-surface. It is a distinct advantage to do it without inflation. Surgeons rarely dilate the rectum except in special cases. The introduction of air into the bladder will probably displace the older method of filling with fluid, as fluid may be dangerous, while air is not. It is, nevertheless, a distinct advantage to be able to do without air, even, as it simplifies the operation and lessens the time of its performance. We consider that such a transverse muscular cut should be sutured, and that the bladder should, in most cases, be sutured.

¹ Archives Gen. de Méd., March, 1894.

² Jour. Am. Med. Assoc., March 16, 1895.

American surgeons, as a class, seem singularly prone to leave the bladder unsutured, but the French and Germans have clearly shown the value of suturing. Albert advises making the wound in the bladder large enough to prevent contusion of the walls when a stone is extracted; otherwise, sutures will not hold. This celebrated operator always uses sutures. Guyon strongly advocates suture of the bladder. Many experiences in suture of the bladder for wounds or rupture should be considered. Tailhefer says that primary suture will often succeed; it will always hold at least three days, and during these three days inflammatory adhesions form that greatly lessen the danger of urinary infection and infiltration.]

Epithelioma of the Bladder.—Weir's¹ views are as follows: Eighty per cent. of bladder-tumors are malignant; secondary growths are late, but involvement of adjacent glands is common; the old method of operation (simple removal) was followed by recurrence in 57 per cent. of cases; after Antal's operation (lifting the peritoneum from the summit and posterior wall of the bladder, removal of growth and infiltrated tissues) only 28 per cent. recur; Bardenheuer removed the entire bladder and controlled bleeding of the neck by the tampon, but the patient died on the fourteenth day, of uremia. The best method of treating the ureters is that shown to be possible on animals (Paoli and Brusachi), to transplant the end of the divided ureter into some part of the bladder-wall. An opening is made in the wall of the bladder, a small circle of vesical mucous membrane is cut out around the opening, the end of the ureter is pushed through this opening and is split in order to enlarge it, and the mucous membrane of the ureter is stitched to the mucous membrane of the bladder. Penrose has done this successfully in a human being. Another treatment of the ureter is to ligate it, as this procedure will be followed by atrophy of the corresponding kidney. [If the urine is aseptic the kidney atrophies after ligation of the ureter. When the bladder was found unfit to be a reservoir for urine, Gluck and Teller tried three methods of treatment: 1. Suture of the divided ureters to a wound in the wall of the abdomen. 2. Implantation into the rectum. 3. Connection with the urethra. The first method is objectionable because it produces a distressing urinary fistula; the second method can be utilized, but is of little practical use; the third method has been applied in extrophy of the bladder. Schwarz has shown that if the bladder is entirely removed (except a small portion around each ureter), a new organ can be generated.²]

THE URETERS AND KIDNEYS.

The Surgery of the Ureter is the title of a very able paper by Fenger,³ whose views are as follows: So soon as diagnosis is made of a wound or a

¹ Med. Rec., 1894.

² See comments in Brit. Med. Jour., Sept. 15, 1894.

³ Annals of Surgery, Sept., 1894.

subcutaneous rupture of the ureter, seek for the seat of rupture and endeavor to restore the continuity of the tube. Catheterization of the ureters from the bladder may give valuable information as to the condition of the kidneys and the advisability of a renal operation. In man catheterization can be performed only after opening the bladder, and it is indicated in selected cases. Catheterization of the ureter from the bladder has cured some few cases of hydronephrosis or pyonephrosis (Pawlik), but it is more difficult and uncertain than nephrotomy and the attempt to discover and correct the constriction of the ureter. Dilatation of the female ureters for the cure of stricture has been done by Kelly, from the bladder, and by Aesberg, from the kidney, with temporary success. Permanent tubage of the ureter from the bladder, formation of a fistula, or implantation of ureter into belly wall is, as a rule, tolerated but a short time and is likely to cause ureteritis. Ureterolithotomy is a safe operation when done by the extraperitoneal plan. The longitudinal wound in the ureter heals without contraction, sutures are not required, and drainage is only needed down to the cut in the ureter. Intraperitoneal ureterotomy is only justifiable when the extraperitoneal route will not afford access to the seat of trouble,

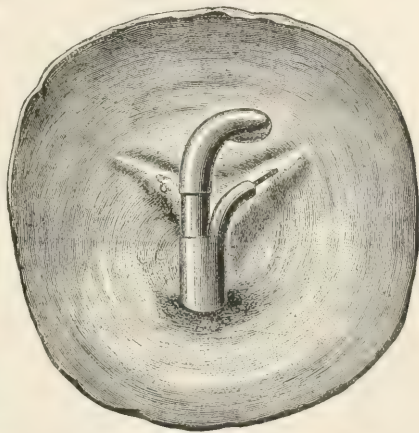


Fig. 57.—Nitze's instrument in use (Berliner Klin. Wochen.).

and if this form of ureterotomy is chosen, the wound in the ureter must be sutured and covered with a flap of omentum or peritoneum, and drainage should be employed. Opening of the abdomen may be demanded to locate a stone, but this operation is exploratory, and even when a stone is found, we should, whenever justified, close the belly-wound and remove the stone by an extraperitoneal operation. In stricture of the ureter, causing pyonephrosis, hydronephrosis, or renal fistula, do nephrotomy, and explore the ureter from kidney to bladder by means of a flexible silver probe, a uterine sound, or an elastic bougie,—(a healthy ureter is permeable to an instrument of the number from 9 to 12 French). If the pelvic orifice of the ureter can not be found, open the pelvis of the kidney (pyelotomy) or open the ureter (ureterotomy). Operate for valve-formation through the wound in the pelvis of the kidney, but if the valve can not be found from

the pelvis of the kidney, open the ureter and pass a sound upwards; the valve must be slit longitudinally. A ureteral stricture, if not too extensive, can be treated as is the pylorus in the Heinecke-Mikulicz operation (longitu-



Fig. 58.—Instrument of Mark Nitze (Berliner Klin. Wochen.).

dinal incision with transverse suturing). Küster resects the strictured part, but Fenger prefers the first method. The upper three-fourths of the ureter can be reached by an extraperitoneal incision, a continuation of the incision

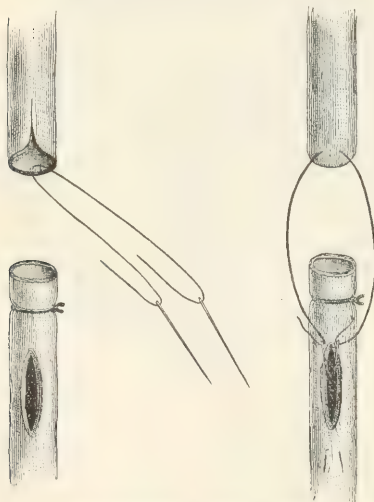


Fig. 59.—Van Hook's Method of Ureteral Anastomosis (Proceedings of Am. Surg. Assn.).

for lumbar nephrotomy, from the twelfth rib down to, along, and one inch anterior to, the ileum, and along Poupart's ligament to its middle. The lower one-fourth of the ureter can be reached by the sacral operation (Cabot), or Kraske's method modified by temporary osteoplastic resection. In women the vesical portion of the ureter can be reached through the vagina. [Fig. 58 shows an instrument by means of which it is claimed catheterization of the male ureters can be easily done from the bladder.]

[Every surgeon should read Fenger's paper and also the very able paper of Van Hook, the surgeon who devised the operation of anastomosis upon the ureters.¹ He tells us that when the ureter is cut across near the bladder, the cut end shall be implanted in the bladder (and this has been practised successfully by Kelly and Penrose), but when the ureter is cut completely across anywhere below the pelvis of the kidney and above the part adjacent to the bladder, perform lateral implantation. Fig. 59 shows Van Hook's method of lateral implantation. This

¹ Read before Am. Med. Assoc., June 3, 1893.

paper is thorough, scientific, logical, and accurate, and were it part of the past year's work instead of belonging to 1893, would receive here an extended notice.]

The Treatment of Floating Kidney is the subject of a paper by Reineboth,¹ who prefers to suture the fibrous capsule with catgut in order to fix the lower half of the kidney. In order to fix the upper half the fibrous capsule is slit up at the posterior edge of the organ, is loosened as far as possible from its attachment to the kidney, the space thus formed is packed with iodoform gauze, and the packing is pushed up high between the exposed kidney-surface and the diaphragm. The rest of the wound is packed, the packing remains for several weeks, and its removal discloses two broad, granulating surfaces which after a time become attached. [There can be no doubt that too many operations are performed for supposed movable kidneys. Cases of general abdominal relaxation with nervous symptoms are frequently subjected to operation, the kidney being stitched, and the procedure threatens to become the fashion. There is nothing more dangerous and irrational than a surgical fashion. We must set our faces against indiscriminate operation, and should only operate for movable kidney when the condition is very obvious or is associated with pronounced symptoms. We believe in most cases that suturing alone produces sufficient fixation. In bad cases, however, Senn's method is advisable :—Two silk sutures are passed through the capsule at the upper angle of the wound and fastened to the periosteum of the twelfth rib, two sutures are passed through the capsule at the lower angle of the wound and fastened to the lumbar muscles, the lips of the wound are widely separated and the cavity packed with iodoform gauze, the gauze being carried as far as possible around the kidney. By this method the exposed surface of the capsule becomes covered with granulation-tissue, which anchors the kidney to surrounding parts, is converted into fibrous tissue, and contracts. The packing is removed in one week and the wound is allowed to heal.]

Nephritis.—Keyes² in a valuable paper upon the Surgical Aspects of Nephritis considers surgical kidney to be invariably due to microbes in the urinary tract. He cites the following causes of microbial invasion :—1. Damage to mucous membrane of the deep urethra, and propagation of organisms along the membrane. 2. Traumatism by the instruments of the surgeon. 3. Bursting of an abscess into the urinary tract. 4. Transmission from some neighboring focus of infection through sound tissue (*bacterium coli commune* from the intestine to the bladder). 5. From the blood to the kidney (very rare). "Over-distention, congestion, and trauma" prepare the soil for infection. He takes up in detail experimental conclusions and clinical experience, and sums up the prophylaxis, the value of germicides, and treatment.

¹ *Centralb. für Chirurgie*, No. 20, 1894.

² *Am. Jour. Med. Sciences*, 6, 1894.

[Weir¹ recently had a one-sided case of surgical kidney cured by nephrectomy. The fact that surgical kidney may be one-sided is to be borne in mind. Goodhart² showed in 1874 that surgical kidney was right-sided in 14½ per cent. of 130 cases. Weir says that even in double surgical kidney incision for drainage might do good.]

Hydrocele is treated by Quattro-Ciocchi³ by introducing a strand of catgut into the tunica vaginalis through the trocar as the hydrocele is being emptied, and leaving the catgut in place to act as a drain.

Surgery of the Cord, etc.—Van Hook⁴ records an interesting experiment he made upon a dog. He divided the vas deferens transversely, applied a ligature $\frac{1}{4}$ inch from the end of the proximal portion, and made a longitudinal incision in the duct $\frac{1}{4}$ inch above the ligature. He trimmed the distal end to a point and made an incision $\frac{1}{8}$ inch long in this end to secure a wide mouth. Sutures were employed to draw the distal end into the opening in the proximal end and fix it there. The postmortem showed a normal testicle, no accumulation of testicular fluid below the site of operation, a patent tube, continuity of mucous membrane, and firm union of muscle-walls. Van Hook concludes that the operation is feasible upon men.

[W. J. and C. H. Mayo record a case in which for injury they resected a large portion of the spermatic cord, one end of the cut vas being pulled against the other over a strand of catgut. The operators say that the result was a success and the testicle remained normal. It is possible to cut the vas in hernia-operations, although, of course, such an accident will rarely happen to the skilful surgeon. In case it should occur, union should be aimed at by this method of suture or by the method of Van Hook.]

Epididymitis is treated by Rollet⁵ with sodium salicylate (90 grs. a day), local use of cold, and application once a day to the surface of 20 drops of guaiacol.

DISEASES OF THE PROSTATE GLAND.

The prostate has been the subject of much investigation, and many valuable papers in regard to it have appeared during the year. The most important surgical discussion of the year, and one of the most important of recent years, has been upon White's operation, orchectomy for the relief of prostatic hypertrophy. Many papers have appeared upon both sides of the subject, the most notable being the calm, lucid, and philosophical brochure of Prof. White himself, entitled "The Results of Double Castration in Hypertrophy of the Prostate Gland." In this paper is gathered together all that is known about the subject, facts are stated with singular fairness, judgments are set forth with remarkable impartiality, and all other import-

¹ Med. Rec., Sept. 15, 1894.

² Guy's Hospital Report.

³ Gaz. degli Ospidali, Nov. 28, 1894.

⁴ Med. News, June 30, 1894.

⁵ Med. Press and Cir., May 23, 1894.

ant articles are alluded to and discussed. The paper consists of three sections: 1. Theoretical; 2. Clinical; 3. Experimental.

Part I. sets forth a theory of causation, rejects the view of Guyon that hypertrophy is a *constitutional* condition peculiar to advancing years and associated with arterial sclerosis, and considers untenable the view of Harrison that the growth is simply compensatory and secondary to certain bladder-changes. Ungratified sexual excitement seems to play a possible part in its production. The testicles, like the thyroid, exert a powerful influence over growth and development. This is also true of the ovaries. Haeckel has told us that changes in the ovary have as important a reaction upon the female organism as have changes in the testicle upon the male organism. The removal of either testicles or ovaries in early life generally changes greatly the characteristics, physical and mental. The testicles may lose the power to produce sperm cells or may never have had that power, and yet by their presence exert an influence that keeps the organism masculine,—that is, many men are sterile and yet still possessed of masculinity. It is probable that this effect is due to a chemical product. These facts show that the function of the testicles is not only to secrete sperm, but also to determine and maintain masculinity. After adult life has been attained, the need for the last-mentioned function begins to disappear, and as it disappears there is removed the necessity for a certain controlling influence, and opportunity is afforded for aberration in growth and structure of the testicles and prostate, which organs at this period of life bear a physiological resemblance to the ovaries and uterus. The modification in the testicular function is equivalent to a failure in the force that restrains cellular activities, and as a consequence of the unexpended energy set free by the lack of need of one function, uterine changes may occur in the woman and prostatic changes in the man. The final atrophy of the ovary induces atrophy of uterine fibromyomata. There is reason for believing that a final atrophy of the testicles produces the same change in prostatic growths, when the patient is not killed by renal or vesical changes before this natural cure can be brought about. Messer and Desmos have both observed that after a certain period of life the frequency of troublesome hypertrophy diminishes. The apparent analogy between uterine and prostatic growths led White to investigate the subject, and his experiments upon dogs gave such remarkable results, that he suggested to the profession castration as a cure for aggravated prostatic hypertrophy.

Part II. presents the clinical evidence and a table of 111 cases. He reports some of the cases in detail, but of 102 cases in the table in which the size of the prostate was noted, 65 showed a distinctly recognizable diminution in size, and in 24 additional cases the improvement in the symptoms was so marked as to justify the belief that the prostate had grown smaller. This shrinking is due to atrophy, first of the glandular elements

and then of the stroma. Dr. White combats his critics and successfully refutes their arguments. He cites cases to prove that the operation is not a physiologic experiment and that the method succeeds when rest in bed and catheterization and careful diet fail. That the shrinking of the gland is not due merely to relief of congestion and edema, but is due to genuine atrophy, is shown by microscopic studies in some patients who have died after the operation. The claim that it is unreasonable to think that an old cystitis can be cured by shrinking of the prostate is met by proof that it has been cured in 52 cases. Not only does cystitis disappear, but there is often return of bladder-power. The claims that cases are reported too soon to be sure of results is dissipated by the fact that 71.3 per cent. of cases have been observed after three months. There have been 20 deaths, a death rate of 18 per cent. These 20 include the cases of Faulds of Glasgow, which should be thrown out of consideration. He lost 4 cases out of 5, a mortality so extraordinary as to demand explanation, and the reports are so lacking in detail that no conclusions are possible. In 2 of his patients perineal section was also performed. In estimating the true mortality due to operation we should leave out those cases in which the patients were practically moribund at the time of operation. The legitimate mortality is about 7.1 per cent. In the 111 cases there are only 10 per cent. of apparent failures. Most deaths are due to uremia. White reviews other procedures adapted to various stages and conditions. He regards castration as far safer than suprapubic prostatectomy, requiring for its safe performance only a proper selection of cases. Local and general health return more rapidly than after prostatectomy.

Part III. As to unilateral castration, the idea that in a minority of cases sufficient unilateral atrophy will follow to improve the condition of the patient is encouraged by some reports; the evidence is contradictory, but some cases have been followed by unilateral atrophy.

Mears has suggested division of the vas instead of the performance of castration. Experiments upon dogs show that division of the vas causes atrophy of the prostate without much change in the testicle. Ligation of the cord or of the vascular constituents of the cord cause atrophy of the prostate, but also disorganization of the testicle.

[In the light of the evidence, it is quite impossible to doubt that Dr. White has made a discovery of the first importance, a discovery that not only aids in clearing up many vexed questions about the physiology of the prostate, but that also enables the surgeon to save many lives. It is not proposed to apply this operation indiscriminately to all cases, no matter what the age or condition, for it is still recognized that most cases require no treatment except the systematic use of the catheter. In the very old and very feeble, however, we must choose between perineal drainage and castration. Perineal prostatotomy with prolonged drainage or the formation of a

permanent fistula often relieves cystitis and may occasionally effect a cure. In most cases, however, perineal prostatotomy is only palliative and the fistula must be kept open during the balance of the patient's life, the individual's condition being one of great discomfort, and a strong liability existing to bladder-infection from a suppurating sinus. After castration the condition is infinitely better, the individual has no inconvenient and disgusting fistula, the gland shrinks in a few days or a few weeks, and the individual is very comfortable, even in many cases regaining bladder-power, though this latter result can not be promised. The shrinking of the prostate gland which follows castration lessens the inflammation and the danger of microbic infection of the ureters and kidneys. In these cases even if the use of the catheter must be continued after orchectomy, it is needed less frequently and there is less obstruction to its introduction. Fenwick suggests that this operation may enable us to avoid the mechanic difficulty of crushing a postprostatic or posttrigonal calculus, the levelling of the vesical base rendering litholapaxy easy.

The rapidity with which a senile prostate atrophies after castration is simply wonderful, and the very success of the procedure has been cited by some as an argument against its value. The opponents of White's operation say, "Such rapid atrophy can not occur," those who have performed the operation say, "We have seen it occur," and the testimony of those who have seen is of infinitely more value than is that of those who say it can not be. There are two psychologic observations that lend confirmation to the value of White's observations. First, is the virulence with which some surgeons have denounced the operation, a heat apparently born of the idea that the testicles possess some special and sacred immunity from operation, which immunity is granted by Nature in fee simple. Second, is the entirely unworthy attempt which has been made by some to appropriate to themselves the credit of White's experiments and studies.]

Among many other important papers upon the prostate we would allude to the following: The Surgery of Hypertrophied Prostate, by Thomas Eagleson Gordon;¹ Diagnosis and Treatment of Prostatic Enlargement, by Belfield;² The Pathology of Enlargement of the Prostate, by C. Mansell Moullin;³ The Effects of Unilateral Castration, by E. Hurry Fenwick;⁴ Observations upon the Effects of Double Castration (White's Operation) upon the Enlarged Prostate, by E. Hurry Fenwick;⁵ Ligation of Iliacs for Hypertrophy of Prostate, by Willy Meyer;⁶ also, articles by Mansell Moullin;⁷ Ramm, of Christiana;⁸ Alexander;⁹ and Watson.¹⁰

¹ Dublin Med. Jour., Feb., 1895.

² London Lancet, Oct. 20, 1894.

³ Brit. Med. Jour., March 16, 1895.

⁴ Brit. Med. Jour., Nov. 3, 1894.

⁵ N. Y. Med. Jour., May 11, 1895.

⁶ Indiana Med. Jour., August, 1894.

⁷ Brit. Med. Jour., March 9, 1895.

⁸ Annals of Surgery, July, 1894.

⁹ Centralblatt für Chirurgie, April 28, 1894.

¹⁰ Brit. Med. Jour., April 18, 1895.

ANESTHETICS.

Relative Mortality.—The Transactions of the German Society of Surgery for 1894 contains a report of the Committee on Anesthesia submitted by Prof. Gurlt, of Berlin. The report for the current year presents a total of 52,384 administrations with 21 deaths, 1 death in each group of 2494 administrations. The results are tabulated as follows:—

Chloroform,	33,083 cases, 1 death in each 1946 cases.
Ether,	11,669 " 1 " " " 5834 "
Chloroform and ether, . .	3,896 "
A. C. E. mixture, . . .	750 "
Bromid of ethyl,	2,896 "

During the year the use of chloroform has decreased by 5317 administrations as compared with 1893, while the use of ether has increased by 5469 administrations. Ether is shown to be less immediately dangerous than chloroform, but all the administrators agree that ether is more likely to produce bronchitis and pneumonia. The higher death-rate from chloroform was not due to the use of an impure drug, as Pichet's purified chloroform was employed in 3890 cases with two deaths. The results of four years of statistical inquiry are combined in the following table:—

Chloroform cases,	166,812, 63 deaths.
Ether cases,	26,320, 2 "
Chloroform and ether cases,	9,014, 1 "
A. C. E. mixture cases,	4,190, 1 "
Bromid of ethyl cases,	7,341, 2 "
Pental cases,	5,970, 3 "

Gurlt urges all surgeons to use ether, as infinitely safer than chloroform.

Mikulicz¹ discusses the relative safety of chloroform and ether, and says in the light of Gurlt's statistics every surgeon who uses chloroform must be able to justify his action, and as a chloroform-giver he attempts this justification. He states that after using ether 80 times during the winter of 1893-94 he has returned to chloroform, not because of any accident during administration, but because of certain unfavorable after-effects. He used pure ether, gave it upon a Quillard mask, and picked the patients, excluding old people, young children, persons with pulmonary trouble, weak heart, or anemia. In his 80 cases there were observed the following unpleasant occurrences:—

Asphyxia,	3 cases, during narcosis.
Collapse after administration,	2 "
Acute bronchitis,	4 "
Edema of lungs and pneumonia,	2 "

[These figures of Mikulicz's table undoubtedly represent real dangers, but in the experiences of American surgeons these dangers are far from

¹ Berlin. klin. Wochensch., Nov. 12, 1894.

being common, and much can be done to obviate them by selection of cases, skilled administration, and the early recognition and prompt treatment of any complication or result, and these dangers do not offer a set-off to the enormously increased danger of chloroform over ether. The blood changes of anesthesia may account for some of the dangers of the condition.^{1]}

Guthrie² considers a number of fatalities in children, following operations in which chloroform was the anesthetic. He concludes that a fatty liver is an absolute contraindication to the administration of chloroform, for chloroform and shock combined intensify the condition, and as a result the system becomes charged with toxic alkaloids in amount far beyond the capacity of the kidneys to remove.

The Kidneys after Anesthetization.—Wunderlich³ has investigated the urine of 125 patients before and after the administration of anesthetics in the clinic of Bruns. In 5 cases albumin was found before anesthetization and in 18 cases after anesthetization. In 3 of the 5 cases albumin was increased by etherization, in the other 2 cases it was not. In the other 13 cases the albumin was but a trace. Wunderlich concludes that albumin when present is increased by ether but not by chloroform, that albuminuria can be caused by ether or chloroform but most often by chloroform, that casts appear more often after chloroform and ether, and that when casts are present either anesthetic will increase their number. [These observations, while they apparently confirm the observations of Rindskapp of Berlin, tend to prove that chloroform is more irritant to the kidneys than ether, and hence that the anesthetic for kidney-operations or for persons affected with kidney-disease should be ether rather than chloroform. As this view is the direct opposite of that usually maintained, the entire subject should be reinvestigated with great care and on a large scale. The established view is drawn from such statistics as those of Carl Beck, that show that when 300 patients without any albuminuria were etherized, 27 of them subsequently showed distinct amounts of albumin in the urine. As a consequence, many operators believe that the after-effects of ether are more dangerous than its direct effects (diffuse nephritis, edema of lungs, collapse, and bronchopneumonia).]

Blake⁴ believes that the so-called ether-nephritis does not appear to exist to any great extent outside of America. Trieber and Roux did not find an instance of albuminuria in several hundred ether cases. Butter found albumin once in 500 etherizations. Korte in 600 cases found albumin in 13; 7 had it before, but the ether did not increase it. Blake examined 50 cases; and in 36, ether produced albuminuria or increased an existing albuminuria. [While the direct effects of chloroform are more dangerous than its after-effects, the anesthetic used should be determined from a study of the

¹ John Chalmers Da Costa in *Med. News*, March 2, 1895.

² *Lancet*, Jan. 27 and Feb. 3, 1894.

³ Quoted in *Brit. Med. Jour.*, May 5, 1894.

⁴ *Boston Med. and Surg. Jour.*, June 6, 1895.

case, the disease, the age, circumstances, and complications. Massing all considerations, ether seems to be much the safer agent, except in the old, the very puny, and the sufferers from kidney-disease or respiratory disorders.]

Salicylic-Anhydrid Chloroform.—Weitzel¹ commends in strong terms chloroform prepared by Anschütz from salicylic-chloroform, a chloroform purified by salicylic anhydrid ($C_7H_4O_2$). He says the stage of excitement is transient and mild, and respiratory irritation is very slight; the pulse does not alter and may even improve, and there is no subsequent depression. It requires from 10 to 20 minutes to produce unconsciousness, but Prof. Weitzel considers the gradual production of anesthesia an advantage because of the greater danger of sudden abolition of cerebral functions. He considers this anesthetic quite as safe as ether. It has no pungent odor and the patient quickly recovers consciousness after operation.

Reflex Cardiac Stoppage.—[Guerin of Paris maintains that death from chloroform can be prevented if the vapor is inhaled exclusively through the mouth. He shows that when tracheotomy is performed upon a rabbit, and then the animal is forced to inhale chloroform vapor through the tube, the drug produces absolutely no effect upon the heart, but if chloroform is inhaled through the nose the heart at once ceases to beat. In this experiment by nasal inhalation the cardiac stoppage must be reflex, as no vapor can reach the lungs because of the cut trachea. This reflex effect Guerin maintains is brought about through the fifth nerve and the cardiac branches of the pneumogastric, and recommends that the nose should be closed with the fingers during the production of anesthesia, the fingers being removed when unconsciousness is produced, as in this state a nasal reflex can not take place.]

Paul Rosenberg² records some observations similar to those of Guerin. He experimented on rabbits by opening the trachea and inserting a tube so that the animal could be made to breathe by the nose alone, by the tube alone, or by nose and tube at once. A glass tube was inserted into the right carotid and connected with a kymographion. Inhalation of an anesthetic by the nose temporarily arrested breathing and produced tracings indicative of depressed cardiac action. Inhalations through the cannula did not arrest breathing and did not depress cardiac action. After thoroughly cocaineizing the mucous membrane of the nose, inhalations by this route did not arrest breathing or depress the heart. With cut pneumogastrics nose-inhalations were without effect on heart or respiration. If the trachea is closed above the cannula inhalation of chloroform through the cannula does not depress the heart or arrest breathing, but if vapor of chloroform be blown into the nose respiration is at once arrested and kymographion-tracings indicate depressed circulation. Rosenberg concludes, as does Guerin, that arrest of breathing and

¹ Centralb. für Chir., No. 52.

² Berlin. klin. Wochenschr., Jan. 7, 1895.

depression of heart-action are not due to the action of the drug in the blood but are true reflex phenomena. He recommends cocainizing the nasal mucous membrane before giving an anesthetic in order to prevent these reflex effects, and maintains that chloroform thus given is the safest anesthetic. [These experiments are of decided interest and of much importance, and should be supplemented by extended clinical observations to confirm or destroy them. The results obtained by these two experimenters furnish us with demonstration of the cause of sudden deaths that occasionally occur after a few inhalations of chloroform-vapor. On theoretic grounds, however, as chloroform is less irritant than ether, chloroform should be safer, whereas we know from an immense collection of results that chloroform is far more dangerous than ether. These observations experimentally confirm a fact long recognized by the surgeon, viz., that cessation of breathing and slowing of the heart do tend to arise in the beginning of the inhalation of an anesthetic, because of reflex stimulation of the vagus, but they take no account of the undoubted action of the anesthetic on the respiratory center which occurs later in the course of inhalation and is independent of circulatory changes.]

Vomiting following the inhalation of chloroform is considered by Lewin¹, who recommends prevention by the method of Mackenrodt, that is, covering the patient's face with a cloth saturated with vinegar, so that all air inhaled contains vinegar vapor. He claims that this expedient quickly allays vomiting.

Atropin Given before Anesthetization.—Blake² considers the value of this measure as a preventive of ether-vomiting, and claims that it is efficient in some cases, but his statistics certainly show that it very often fails. He makes the statement that the Trendelenburg position tends to produce vomiting by pushing the stomach against the diaphragm and this muscle against the heart and lungs, and further, that this position increases shock. [After a large and favorable experience with this position, we have never noted any increased tendency to vomit because of its employment, and believe that it combats shock by allowing considerable blood to pass to the great nerve-centers. This position is of the greatest possible value, and not only in abdominal and pelvic operations. In operations about the face and mouth it permits the surgeon to proceed without interruption, it saves the annoyance and danger of blood passing into the air passages, and can be employed with entire confidence and safety.]

Anesthetization during Sleep.³—An observation of great interest in a medico-legal point of view is in regard to a woman who was chloroformed while asleep. She passed quickly and without waking or struggling into the anesthetic state, in which several teeth were extracted; and when she awoke was astonished to find her teeth gone.

¹ Sem. Méd., 1894.

² Boston Med. and Surg. Jour.

³ Therapeutic Gazette, Nov. 15, 1894.

Apoplexy During Ether-narcosis.—Senger¹ calls attention to this danger, to which elderly persons are liable. He believes such an accident has happened in many cases when no diagnosis was made. The author reports a case and tells us that the danger is greater with ether than with chloroform. [A death occurred in Philadelphia a few years ago from apoplexy during ether narcosis. Some years since we saw a case of apoplexy coming on a few hours after recovery from the anesthetic.]

Edema of the Lungs.—Poppert² reports a death from edema of the lungs following ether narcosis. [The elder Gross used to cite a case in which edema of the lungs arose during the administration of ether. The administration of ether was at once suspended and the patient was bled. Recovery ensued.]

Resuscitation in Chloroform-asphyxia.—Kelly³ has in 15 cases pursued the following plan:—

“The administration of the anesthetic is at once suspended, the wound is protected, and if abdominal, a broad piece of gauze is laid over the intestines under the incision. An assistant steps upon the table and takes one of the patient’s knees under each arm, and thus raises the body from the table until it rests upon the shoulders. The anesthetizer at once brings the patient’s head to the edge of the table, where it hangs extended, with the trachea and nasal cavity in line. The operator stands at the head and institutes respiratory movements as follows: *inspiration*, by placing the open hands at each side of the chest posteriorly over the lower true ribs, and drawing the chest forward and outward, holding it thus for two seconds; *expiration*, by reversing the movement, by placing the hands on the front of the chest, over the lower ribs, and pushing them backward and inward, at the same time compressing the chest. The success of the manœuver will be demonstrated by the rush of air in and out of the chest. The heart and pulse should be carefully watched. As the respiratory movements are continued, a little, flickering pulse-wave will be observed at the wrist, which shortly becomes faint and regular, and gradually increases in strength. From 10 to 30 of these respiratory movements will be sufficient to excite voluntary breathing. Movements must be timed to suit the natural efforts. This method is not available in the case of patients with constricted fusiform chests (tight lacers); in such cases direct anteroposterior compression must be practised over the lower third of the sternum, with one hand pressed there, and the other placed on the back at a point opposite the one in front.”

Rectal Etherization was suggested by Pirogoff forty-eight years ago. It has been tried by many operators at many times but has never come to be regarded as a thoroughly legitimate procedure, and has been practically

¹ Deutsch. Med. Woch., No. 37, 1894.

² Deutsch. Med. Woch., No. 37, 1894.

³ Johns Hopkins Hospital Reports, vol. iii., No. 7, 8, 9, 1894.

abandoned because of its dangers. Stedman¹ of the Sheffield Hospital makes a plea for this method. He uses Buxton's apparatus—a double-necked bottle containing ether, each neck being fitted by rubber corks; through one cork a perforation carries a glass tube bent almost to a right angle. The ether-vapor passes along this and a connected rubber tube into the rectum. In the rubber tubing is set a glass tube with a central bulb to collect any liquid ether that might otherwise pass into the rectum. The ether bottle is set in water at 120° in order to ensure rapid vaporization. This method avoids the unpleasant choking and to a great extent the struggling so common during the administration of ether by the usual plan, and vomiting after it occurs in only one-half of the cases. Time required to produce anesthesia is variable,—from five to thirty minutes. Stedman employs rectal anesthesia chiefly for operations about the face, neck, nose, and mouth, but has used it in other cases. The uncertainty of this method is shown by the statement that in some cases in which anesthetization requires a very long time, rectal administration should be supplemented by inhalation. The after-effects are less than when ether is given by the mouth, the patient reacts rapidly, though occasionally a slight diarrhea arises. [Stedman only reports 10 cases, says nothing whatever about possible dangers, and fails to establish a claim for a writ of ejectment against ether by inhalation.]

Head-Posture.—Hare² considers the effect of various postures of the head in accidents during the administration of anesthetics. He agrees with Howard that traction on the tongue can not raise the epiglottis, but asserts that as in many cases the drawing forward of the tongue does clear the air-passages, the obstruction in these cases must be due to the tongue rather than the epiglottis. [That this statement of Hare is true can not be doubted, as every surgeon has seen it verified; there are some cases of incomplete anesthesia in which traction upon the tongue causes a deep inhalation through reflex action (Lister), and in complete anesthesia some cases of respiratory obstruction are due to the tongue and are relieved by traction upon it, others are due to the epiglottis and are not removed by tongue-traction, but are to be removed by lifting the epiglottis. Surgeons will recall that Howard, in 1889, advocated complete extension of the head downward and backward to lift the epiglottis.] Hare maintains that Howard's position "has the effect of strapping the soft palate over the dorsum of the tongue, thereby cutting off the entrance of air through the mouth." Hare advocates extension with forward projection of the head, and maintains that such a posture raises both the tongue and epiglottis and so draws the soft palate as to permit of breathing through the mouth as well as the nose.

¹ Quarterly Med. Jour., of Sheffield, Jan. 18, 1895.

² Bull. Johns Hopkins Hospital, Jan., 1895.

Infiltration Anesthesia is a plan devised by Schleich,¹ the principle being to infiltrate the entire field of operation with fluids as indifferent as possible to the organism. Exact anesthetization by infiltrating the entire field with cocain is rarely possible, because a considerable quantity is needed to infiltrate, and a considerable quantity of cocain is often poisonous. He prepares three solutions :—

No. 1. For strongly hyperesthetic regions (as in inflammation, suppuration, and neuralgia) :—

Cocain hydrochlorate,	1 gm.	} Strong solution.
Cocain phosphate, . . . . .	.06 gm.
Sodium chlorid (sterilized), . . . . .	.6 gm.
Distilled water ("),	100 gm.	
Phenol (4 per cent.),	2 drops.	

This strong solution can be used in amounts of 50 c.c. and for extensive operations can be diluted three or four times with normal salt solution.

No. 2. For moderately hyperesthetic regions :—

Cocain hydrochlorate,05 gm.	} Normal solution.
Cocain phosphate, . . . . .	.06 gm.
Sodium chlorid (sterilized), . . . . .	.6 gm.
Distilled water ("),	100 gm.	
Phenol (5 per cent.),	2 drops.	

No. 3. For extensive operations :—

Cocain hydrochlorate,01 gm.	} Weak solution.
Morphin hydrochlorate, . . . . .	.005 gm.
Sodium chlorid (sterilized), . . . . .	.2 gm.
Distilled water ("),	100 gm.	
Phenol (5 per cent.),	2 drops.	

[That the dangers of cocain when used in any amount are real and not imaginary is certain, and any method to limit or destroy these dangers is worthy of attention. Schleich's plan is ingenious, apparently sound in principle, and is worthy of a careful trial. Wurdeman² wrote an excellent explanatory paper with a full discussion on this method.]

Nasotubal Anesthesia.—Souchon has made a very valuable contribution to surgery in an apparatus of his own devising. A tube is passed along the nose or mouth into the pharynx and the anesthetic vapor is forced in by a most ingenious apparatus. We thus have the anesthetizer and his apparatus out of the way of the surgeon during operations about the face, head, and neck, utilize all of our anesthetic and thus prevent waste, and are able to accurately know how much of the drug the patient has taken, and to obviate the dangers to respiration and heart through reflex-irritation of the nasal mucous membrane as set forth by Guerin and Rosenberg. In Souchon's first apparatus chloroform or chloroform with ether was employed; in his improved apparatus ether or chloroform can be given alone (Fig. 60).

¹ Aerzte Rdsch., 1894.

² Jour. Am. Med. Asso., Dec. 29, 1894.

A New Method of Using Cocain.—Krogius¹ finds that if cocain is injected into the subcutaneous tissue near a nerve-trunk, analgesia is produced in the peripheral distribution of the nerve. An injection across the root of the finger produces complete analgesia of the entire digit, of all the tissue, deep and superficial. Injection over both supraorbital notches produces analgesia of the middle of the forehead. Injection over the ulnar nerve at the elbow produces analgesia over the entire peripheral distribution. A 2 per cent. solution is used. Abolition of sensation is complete in from five to ten minutes after injection and lasts for fifteen minutes or more. That this plan must have positive value is shown by the records of 200 operations performed by its aid at Helsingfors, comprising amputations of fingers and toes, circumcision, etc. That a weak solution is efficient is a great safeguard against the danger.

Rapid Anesthesia.—Magill² advocates the rapid induction of anesthesia

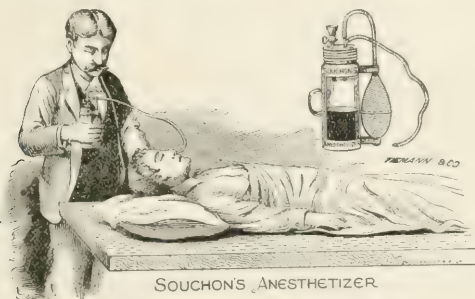


Fig. 60.—Souchon's apparatus for nasal-tube anesthesia.

by means of ethyl bromid and the substitution of chloroform to maintain unconsciousness. He maintains that ethyl bromid can not produce primary syncope from nasopharyngeal reflex, that it stimulates cardiac action, and is much less toxic than chloroform. Ethyl bromid is given on a folded towel, and after three or four inhalations the patient loses all sense of touch and pain but is still conscious. Complete unconsciousness is induced in about a minute and chloroform is then substituted. In spite of numerous recorded fatalities from ethyl bromid, Magill believes it to be a safe agent, and holds that some deaths assigned to its influence were really induced by other causes. [In comment we would quote Hare (Practical Therapeutics), who asserts that ethyl bromid has a powerful influence over the heart, that alcoholic subjects are especially susceptible to its lethal effects, and that the employment of the drug throws a great responsibility on the surgeon. In the German anesthetic statistics, out of 7341 administrations of bromid of ethyl, there were 2 deaths.]

¹ Centralb. f. Chir.,

² Internat. Med. Mag., June, 1894.

Measures for Resuscitation.—[When the heart suddenly fails during the administration of an anesthetic, how should a patient be treated? Leedham-Green tells us that strychnin, inhalations of amyl nitrite, and cutaneous stimulation are useless, and he recommends a method modified by Maas from a plan suggested by König. In König's method the operator stands upon the patient's left side and faces him and lays the open hand upon the patient's chest with the ball of the thumb between the apex-beat of the heart and the edge of the sternum and presses in the chest-wall quickly and strongly 30 times every minute. Maas advises quick compression (120 times a minute) and states that it is invariably used in the Göttingen clinic. Green reports one remarkable case of recovery after the lapse of a period of seven minutes, during which time there was no detectable breath or heart-beat, claims that the method owes its efficacy to direct action upon the heart, and asserts that in a fresh cadaver a distinct pulse-wave can be felt in the carotids on quick and forcible precordial compression, and the pupils will be found to contract as the blood moves through the capillaries of the iris.]

Ether-Anesthesia.—Prince¹ presents observations upon 500 consecutive cases of ether-anesthesia. His conclusions are as follows:—1. Absolute dependence cannot be placed upon any one sign as a signal of danger in all cases. 2. In the majority of cases danger shows itself first through embarrassed respiration; in a smaller number of cases circulation and respiration are practically simultaneously affected, and in a still less number the heart is primarily affected. 3. Surgical shock is possible under complete anesthesia, especially during operations upon inflamed or highly sensitive abdominal or pelvic viscera. 4. Pulling the tongue forward in certain cases of asphyxia is an aid to resuscitation, whether the effect of such traction is simply in removing pharyngeal obstruction or in raising the epiglottis. 5. In case respiration is not at once reestablished by the ordinary means, including extension of the head, raising of the jaw, and traction upon the tongue, a finger should be inserted under the epiglottis and this raised away from the glottis. 6. Threatened vomiting may be controlled in a large percentage of cases by means of phrenic compression.

Tracheotomy after Apparent Death from Anesthesia.—Poncet² strongly advises this measure, and states that this operation allows of a free flow of air from the effects of artificial respiration, and permits direct introduction of air through the cannula, and does not interfere with rhythmical traction on the tongue. Poncet has been obliged to perform tracheotomy thrice for this purpose.

¹ Chicago Med. Record, May, 1895.

² Lyon Médicale, April 13, 1895, and La Mercredi Médical, Dec. 26, 1894.

WOUNDS, BURNS, ULCERS, PLASTIC SURGERY, AND MISCELLANY.

Ellison¹ gives the history of a case of depressed nose in which seven years ago he corrected the deformity by introducing a metal plate. He made an incision with a tenotomy knife on either side and across the nose, raised the flap, inserted the plate, drew the integument over the flap, sutured with horsehair, inserted a strand of catgut as a drain, and dressed with collodion, except over the catgut drain. Gauze was applied as a dressing. Healing took place by primary union. [In an operation of this kind performed by Dr. Keen a single incision was found sufficient to admit the plate and no drainage whatever was required. The metal plate employed had numerous perforations in it in order to permit granulations to grow through them, thus anchoring the plate firmly in position. The result was excellent.]

Burns.—Wilbouchewitch² presents a dissertation upon the antiseptic treatment of burns. She concludes that recent burns, superficial or deep, can heal without the production of pus if treated antiseptically. If pus is produced, the wound should be disinfected, when the course of healing will be the same as if no infection had occurred. If pus is of long standing and the wound begins to granulate, disinfection is impossible. If it is necessary to disinfect large burns, an anesthetic will have to be given. If the wound is nonpurulent, the unnecessary use of a chemical germicide hinders healing. Antisepsis is the best means of allaying pain. Burns of the second degree require eight days to get well under antiseptic treatment. Burns of the third degree require from two to three weeks. Burns of the second and third degree heal without scar. Burns of the fourth degree leave scars which do not retract. It may be laid down as a rule that the less the amount of pus the smoother will be the scar.

Acetanilid.—Thomas S. K. Morton³ contributes an article in which he warmly advances the use of acetanilid in surgical cases upon wounds, granulations, tuberculous lesions, tuberculous bone-cavities, and chancreoids. He says the action of this agent upon wounds, especially upon granulations, is to check or prevent the formation of pus. It does not irritate the skin or the wounds. If a considerable amount of the drug is used on a large surface and the precaution is not taken to dilute it, toxic symptoms may become manifest. Acetanilid, even when much diluted, causes the cessation of all ordinary suppuration. Wounds that are badly infected are likely to heal, as a rule, without further suppuration, under the use of this agent applied either in the wound or as acetanilid-gauze or as an ointment of the strength of 1 to 8, or dissolved in alcohol, water, or oil, and used as an injection. The injection of an alcoholic, watery, or oleaginous solution of acetanilid is employed for fistulas; the effect of acetanilid upon chancreoids is truly remarkable.

¹ Lancet, Feb. 17, 1894.² Dissertation, Paris, 1893.³ Phila. Polyclinic.

Blood-serum in the Treatment of Wounds and Skin Diseases.—Schleich¹ reports his experience with this agent. He used fresh bovine serum mixed with 25 per cent. of zinc oxid, laid upon plates dried and powdered. Two sorts of preparation were made from this powder. First, a serum-paste soluble in water, nonirritating and free from acids and used to cover ulcers, eczematous areas, and burns. It adheres to the part and becomes dry in a few minutes, but can be easily washed off. The preparation can be sterilized at 70° C. When heated above 100° the pulvis serosa is formed, which can be used pure or with iodoform and that dries quickly and forms a scab. This agent enables us to form a moist blood-scab. Wounds not absolutely clean are treated first with a nuclear serum-powder. Nuclein is a substance derived from the nuclei of cells. It is a powerful chemie compound, and when in a 2 to 3 per cent. combination with serum-powder destroys the dead and dying tissues in the wound by a sort of digestive process, but does not injure the healthy tissue. It forms a clean wound. Mercurial serum used dry can replace the usual inunctions in the treatment of syphilis. Three to 5 grams of the paste are smoothly applied with a brush to the skin. It is allowed to dry and three days later is removed while in the bath.

A Case of Cut-throat.—Hislop² records a case in a man seventy-four years of age. He had a huge, gaping, and slightly lacerated wound of the neck extending to within half an inch of the carotids on each side. The trachea was almost completely severed, the band that was left being not more than a quarter of an inch wide. Hislop tied 4 arteries, brought the ends of the trachea together with 4 strong silk sutures, washed the big cavity of the wound out with cold spring water (this case was in the country), and brought the surfaces together with 10 interrupted sutures. Recovery followed uninterruptedly. [This emphasizes the fact that the old theory of surgery, that cut-throat wounds should not be sewed up, is erroneous, and we should endeavor to close them exactly as we do a wound in any other part of the body. The proper suture material here would seem to be kangaroo tendon for the buried sutures.]

Stab-wound of the Pericardium with Division of the Intercostal Artery.—Dalton³ records a remarkable case. A stab cut an intercostal artery and opened the pericardium. Dalton operated upon the case. An incision 8 inches long was made over the fourth rib, 6 inches of the rib were resected, the bleeding intercostal artery was ligated, the blood was turned out of the pleural cavity, this cavity being irrigated with hot water, the wound in the pericardium, 2 inches in length, was sutured, and the external wound was closed. Recovery followed.

¹ Verhandel. d. deutsch. Gesellschaft für Chirurgie, XXIII. Congress, 1894.

² Lancet, June 30, 1894.

³ Annals of Surgery, Feb., 1895.

Suture of the Heart.—Del Vecchio¹ reports a series of experiments upon dogs with the conclusion that suture of the heart in human beings in case of wounds is a possible operation. He proposes in the case of wounds in the human heart the following procedure: Two longitudinal incisions to be made from the lower border of the third rib to the upper border of the seventh rib, one running along the inner margin of the sternum, the other about 10 mm. inside the nipple-line. These incisions joined by a horizontal cut made in the fourth intercostal space. The fourth, fifth, and sixth ribs and cartilages are divided and the outer cutaneous flaps turned up. Push aside the pleura with the finger, expose the pericardium and incise it longitudinally, and suture the heart-wound by interrupted sutures. [Death in cases of wound of the heart is due to pressure from effused blood in the pericardial sac, and because this pressure is itself a check to further hemorrhage there seems to be rather a question whether operative interference will not be more harmful than beneficial as far as hemorrhage is concerned. Paracentesis, followed if necessary by incision of the pericardium, is advised by some surgeons.] He tells us that Fisher collected records of 376 cases of wound of the heart with a mortality two to three minutes after the injury of 20 per cent. Death may occur in periods of from a few seconds to nine months after the injury.

Oxygen in the Treatment of Wounds and Ulcers.—Stoker² calls attention to the great value of oxygen in the local treatment of wounds and ulcers. The oxygen may be either pure or diluted with pure air. He tells us that the oxygen produces some profound change in the surface of the wound. His first apparatus consisted of boxes into which the oxygen flowed, but simple rubber bags will do as well. If one wishes to apply treatment to the knee, he should have an indiarubber receptacle open at both ends, larger at one end than the other. The smaller end embraces the limb below the knee, and the upper end embraces the limb above the knee, and the oxygen is admitted into this chamber. When the limb is enclosed in the indiarubber receptacle it is not necessary to have a continuous stream of oxygen, but when it is enclosed in a box, as a certain amount of leakage inevitably occurs, we must furnish a continuous stream of oxygen. When we use the indiarubber case it is only necessary to fill the bag with oxygen, turn off the tap, and after five or six hours fill it again. Instruments are made to apply oxygen to different parts of the body. This treatment relieves pain remarkably, stimulates the discharge of old ulcers, and greatly alters its character. In regard to the healing process it is found that the new tissue is not cicatricial, but is similar to and continuous with that of surrounding parts. There are no redundant granulations formed. Stoker thinks this treatment might be successful in cases of lupus and even in cases of epithelioma. He is now trying ozone instead of oxygen.

¹ *Bif. Med.*, April 4, 5, 1895.

² *Med. Press and Circular*, April 17, 1895.

The Treatment of Leg-ulcer by Chlorin Gas.—River¹ advises this procedure: The gas is generated by pouring 2 drams of potassium chlorate and 1 dram of hydrochloric acid into a jar, the outside being covered by brown paper. A disc of white paper is then introduced, and on top of the paper sufficient absorbent wool. A large cork is then fitted to the neck of the jar. The saturated wool is placed over the ulcer, quickly covered by guttapereba tissue, kept in place by ordinary bandages. The author reports very favorable results.

Potassium Permanganate in Chronic Ulcers.—Waughop² advises the use of a saturated solution of this drug. His method is as follows: Swab out the slough and flood the ulcer for ten minutes with permanganate solution. Severe pain is produced for the first two minutes. Sponge the ulcer dry and pack it with strips of gauze soaked in the fluid. Apply a heavy permanganate poultice,—that is, a piece of gauze dripping wet with the solution,—cover it with oiled paper, and bandage lightly with cheesecloth. Dress every day or two by this method. Granulations soon appear. [This procedure is often productive of agonizing pain.]

The Treatment of Chronic Ulcers by the Electrostatic Brush-discharge.—Marquant³ tells us that in young persons of good general health the ulcers very rapidly assume a healthy aspect and proceed to heal under this treatment. In patients more advanced in age, or of an unsound constitution, the improvement comes, but more slowly. The results in varicose ulcers of the leg have been very striking. The treatment is repeated twice a week, the positive pole being used.

Sulphur in Surgery.—Lane⁴ strongly recommends the local use of sulphur in surgery, not only in tuberculous conditions but in other infective processes.

Erysipelas.—Felsenthal⁵ advises the following treatment: Make superficial and deep scarifications, squeeze out the edematous liquids, rub into the erysipelatos area a 60 per cent. ichthyol ointment, and apply a dressing of iodoform gauze.

Are There Seasons Unfavorable for Surgical Operations? is the title of an interesting and important paper by Abbe.⁶ He concludes that the argument is in favor of ignoring the season, indeed, that the experience of surgeons shows that the conduct and result of fractured bones, for instance, are entirely independent of season, and for all practical purposes any properly conducted surgical operation with aseptic work, and covered in by aseptic dressings, is equivalent to a subcutaneous wound that proceeds as harmlessly as do the fractures. He feels that it is right to say to any patient contemplating an operation that it is as well to do it now as at any other time.

¹ Universal Med. Jour., July, 1894. ² Boston Med. and Surg. Jour., May 10, 1894.

³ Arch. d'Electr. Méd., Aug. and Sept., 1894.

⁴ Lancet, April 7, 1894.

⁵ Centralblatt für Chirurgie, No. 16, 1894.

⁶ N. Y. Med. Rec., Apr. 7, 1894.

Mustard and Sugar as Antiseptics.—Park¹ calls attention to the surgical uses of mustard. It has long been recognized as a deodorant, but he cites clinical experience to prove that by washing wounds with water and flower of mustard we not only deodorize but likewise disinfect them. This is important to remember in emergency cases in country districts where modern antiseptics may be inaccessible. He also shows us the value of sugar as an antiseptic. He says that dilute sugar solution may serve as culture media for bacteria, but that neither pathogenic forms nor saprophytic organisms can grow in concentrated solutions of syrups. When sugar is used deliberately as an antiseptic it is well to add and mix with it a small proportion of naphthalin (from 1 to 2 per cent.).

The Sterilization of Catgut.—Schimmelbusch² advises the following method of disinfecting catgut, which is employed in the clinic of Prof. Von Bergmann: After removing the contained fat, place the gut in a 1 per cent. solution of mercuric chlorid in 80 per cent. alcohol and frequently stir it. Such gut is free from microorganisms. Kiliani³ advises the following method of sterilizing catgut: Dry gut is placed in absolute alcohol for twenty-four hours, is cut off in pieces of 2 or 3 yards length, one of which is rolled on a glass rod and is placed in a glass tube open at one end and with a little hole in the other, through which a short end of catgut is pulled. The glass rod is removed and the roll of catgut is in the glass tube. This tube, with its contents, is put in a second glass tube and both are put in a dry hot-air sterilizing apparatus, the temperature of which is brought within one hour up to 176° F. This is to cause evaporation of the alcohol and water. The open end is then closed by melting the glass, and the hermetically-sealed tube is put again into the sterilizing oven, the temperature of which is brought up to 280° F., which is kept up for a whole hour. When the temperature has sunk the outer tube is scratched with a file and is ready for use. Immediately before using the outer tube is broken and the inner tube, with its contents, put for two minutes into the solution in which the instruments are lying. [This is really a modification of Reverdin's method.] Tscherning proposed the following method: The gut is cut in length suitable for operation and enclosed in double sealed envelopes. These are placed in a sterilizing oven and the temperature raised gradually, an hour being occupied in increasing the heat to 176°, and two hours more in increasing it to 302° F. The gut remains exposed to this temperature for three hours. This gut is absolutely sterile. Eastman advises the sterilization of catgut by boiling it in olive oil for three hours. He thinks that the gut is stronger and smoother than if subjected to the ether-alcohol-bichlorid process. Repin⁴ advises the following method of sterilizing catgut: Remove the fat from the gut by ether or by carbon-bisulphid. Dry the gut completely by sulphuric

¹ Med. News, Dec. 22, 1894.

² Med. Rec., June 30, 1894.

³ Med. Rec., May 19, 1894.

⁴ L'Union Médicale, No. 64, June, 1894.

acid in the desiccator or by placing it in a dry stove, in which the temperature is slowly raised to 110° C. and is kept at that for an hour. Place the gut in absolute alcohol in sealed tubes, and place these tubes in an autoclave at a temperature of 122° about an hour. The alcohol must be absolute. A temperature of 120° C. destroys the most resisting germs known. The value of this method may be shown by the fact that the author took catgut from an animal dead of anthrax, treated it in this manner, and inoculated three guineapigs with it, none of them developing infection. [We consider the best method of preparing catgut to be that devised by Mr. Johnston, of the Jefferson Hospital, Philadelphia. The gut is smooth, pliable, peculiarly strong, and retains its strength for an indefinite period of time. The method is as follows: First, steep the gut, as received from the manufacturer, in the best ether, allow light gut to remain in it for not less than twenty-four hours; heavy gut for forty-eight hours. When it has been steeped a sufficient length of time in the ether transfer it directly into a mercuric-chlorid mixture consisting (proportionally) of 40 grs. of mercuric-chlorid and 200 grs. of tartaric acid in 12 fluid ounces of 95 per cent. alcohol. Very fine gut should not remain in the mercuric mixture longer than from five to seven minutes, the next size ten to fifteen minutes, and the third and fourth sizes from twenty to twenty-five minutes respectively. Before transferring the gut from the ether into the mercuric-chlorid mixture, jars for keeping it ready for use should be at hand, thoroughly scalded, and then bathed in an aqueous solution of mercuric-chlorid (1 : 1000). When the jars are ready they should be nearly filled with alcohol (95 per cent. strength), containing palladium-bichlorid in the proportion of $\frac{1}{16}$ of a grain (2 drops of a solution of it, which contains 15 grs. of the salt to the ounce) to the pint of alcohol (more of the true bichlorid of palladium will not stay in solution in alcohol, and when a precipitate occurs through excess of the palladium the whole goes to the bottom and is not again soluble in alcohol). As the gut is lifted from the bichlorid mixture it should be dropped into the prepared alcohol, and is then ready for use, and will keep as far as is yet known for any length of time. When an operation is about to be performed, a piece of gauze, a clean handkerchief, or a napkin wet with a mercuric-chlorid solution should be wrapped round the jar after the mouth has been well wiped with a wet bichlorid cloth. The quantity of gut judged necessary for the operation should then be lifted out by means of a sterilized instrument and dropped into a dish, previously sterilized for the purpose and having sufficient alcohol in it to keep the gut from drying. If any of the quantity laid out for use at an operation is left, it may be put back again into the jar, but should first be immersed in the corrosive mixture and left for two or three minutes in it. If there is suspicion of the jar having been opened without due precaution having been taken, the safest way is to pour off the alcohol and fill the jar with the corrosive mixture, which, in two or three

minutes, may be poured back into its own jar, and fresh alcohol put upon the gut. By such means there is absolute safety against infection from the gut. Careful laboratory experiment and extensive clinical observation prove the fact that this gut is sterile.]

ACTINOMYCOSIS.

Actinomycosis of the Mammary Gland is treated by Muller.¹ He refers to certain recorded cases in which the mammary gland became secondarily affected by extension from the chest. Primary actinomycosis occurs in the udders of swine and cows, and its origin is in contact with straw. He records two cases of primary mammary actinomycosis in women. One case occurred in a woman toward the end of lactation in the unused breast and subsequent to a blow. A nodule appeared which suppurated, incision was practised, and the wound healed in two months. After a time the breast became very hard, a tumor was discovered the size of a hen's egg, and a sinus formed. Glands were not enlarged and general health was good. The sinus led into a cavity containing actinomycotic granules; the breast was removed, the pectoral muscle was found healthy, and sections of breast-tissue disclosed actinomycetes. The other patient was supposed to have either mastitis with abscess or tuberculosis, but sections of breast-tissue disclosed the fungus. Both cases recovered. The origin of both cases is obscure. Each had received a blow upon the breast, and each had been incised and had applications of linseed meal.

[J. Collins Warren in his *Surgical Pathology* gives an excellent consideration of this subject. He tells us that cultures of actinomycetes are only made with great difficulty; inoculations have been made by introducing the granules into the peritoneal cavity of rabbits; there is no certain demonstration that the meat of animals can be a vehicle for the disease-germs and no observations exist to prove that milk transmits it; he quotes Bostioni to the effect that the disease often begins in the antrum; the fungus grows on ears of grain, and this grain is the bearer of the disease to animals and men. One of the author's cases was in the habit of chewing barley and rye; the most common route of infection is the mouth and pharynx and after once gaining a lodgment the parasite is carried by the blood to distant parts and is not conveyed by the lymph-current. In man the disease presents as special features the formation of abscesses and the presence of yellow granules in the pus and in the granulations of the abscess wall; adjacent muscles are infiltrated; the raw surface of a ruptured abscess is yellowish or violet in color; sinuses form and the nerves and bones become involved. The jaw is the part most often diseased. Treatment consists in an attempt to remove completely the entire mass, and if this cannot be done the parts are incised and the sinuses scraped. Warren

¹ Munch. med. Woch., Dec. 18, 1894.

holds that internal medication is valueless. We would call attention to the use of potassium iodid internally for actinomycosis. This was first employed on cattle in 1893, and has during the past two years been used on man with some very positive successes. Some cures from this drug have been recorded.¹ It seems highly probable that this disease is far more common than is usually supposed, as the diagnosis is very often not made. Every case of supposed inoperable malignant disease should have an examination made for the yellow granule and for the fungus, and in very doubtful cases rabbits should be inoculated. In regard to the granules, they are not invariably yellow, but may be brownish or greenish.²]

¹ Buzzi, *Centralbl. f. Chir.*, 1893, 698, *Milt. of Cairo*, etc.

² Max. Wolff, *Berliner Medicin. Gesellschaft, Deutsche Medizinal Zeitung*, No. 19, 1894.

OBSTETRICS.

BY BARTON COOKE HIRST, M. D., AND W. A. N. DORLAND, M. D.,
OF PHILADELPHIA.

PRELIMINARY AND GENERAL CONSIDERATIONS.

Methods of Obstetric Instruction.—The question of the education of students and practising physicians in the proper care of the pregnant and parturient woman has been very thoroughly agitated during the past year. Davis, Markoe, and Lambart of our own country, Champneys of England, and Klein of Germany may especially be noted as energetically contending for a higher grade of education in this important department of medicine. Davis¹ says: "The saving of human life and suffering which the knowledge of proper methods of diagnosis, familiarity with antiseptics, and education in obstetric operations have brought about in the hands of the few and skilled must be reflected in the teaching given to students;" and again: "The teacher of obstetrics must be prepared not only to exemplify in his wards an advanced stage of scientific work, but to make practical application of the same amid the less favorable surroundings of the lodging or tenement." He further maintains that because labor is a physiologic and spontaneous process *only* in physiologic individuals, "the indiscriminate assignment of confinement cases to medical students during their tutelage is an offence against medical science and municipal law." He recommends, however, that the student should visit the homes and the hospitals under intelligent supervision. In the organization of the corps of a medical staff for obstetric teaching Davis suggests the following:

"The head of the department should be a man able and willing to perform, according to the best modern methods, any obstetric operation at any time and place. He should be physically capable of the exertion that pelvic and abdominal surgery requires in difficult operations. He should be possessed of the requisite instruments and apparatus to operate at any time in the hospital or in private houses. He should have the energy and devotion to his work that will lead him to undertake operative treatment when necessary, and the honesty of purpose that will lead him to promptly accept a responsibility that rightfully belongs to him. His field of operation should include Cesarean section, symphysiotomy, the high application of the forceps, and version; if the case be complicated, embryotomy, the treatment of inversion of the uterus, eclampsia, and dangerous hemorrhage. He should personally

¹ Med. News, Oct. 6, 1894.

decide in cases of puerperal sepsis whether or not operative interference of any nature whatever is indicated. He should instruct medical students by lectures and clinics, and the entire material of the service, both in-door and out-door, should be absolutely at his disposal. Next in rank to him may come his assistant and demonstrator, who should be versed in palpation and auscultation, in the immediate operation for laceration of the perineum, in methods of treating hemorrhage and eclampsia, and in all obstetric operations by which faulty presentations are corrected. He should be a graduate of several years' experience, and a man of vigor and energy and sufficient devotion to his work to enable him to willingly undertake a considerable amount of arduous physical exertion. In addition, he should have a working knowledge of the modern languages, in order that there may be a constant study of the current literature. In obstetric hospitals it is often best to add to this service a third graduate physician—namely, the resident physician. He may be appointed by competitive examination immediately after graduation. His province is to attend regularly the wards of a lying-in hospital and patients confined at their homes. He is expected to deliver normal cases, to assist at abnormal cases, and to learn by every opportunity presented. In accordance with his intelligence he will be taught the use of the forceps, obstetric manipulations during labor, the technique of intrauterine douching and curetting, and the management of the healthy infant. He should report immediately to the demonstrator any abnormality occurring in his practice, and should be immediately under the supervision of the demonstrator."

Davis also sets down some rules for the education of obstetric nurses. He says that their course of instruction should first include graduation in a good hospital; at least three months' service should then be procured in an obstetric hospital, where, in addition to the usual course, the nurse should be instructed in the examination of urine, chemically but not microscopically, and in the administration of ether and chloroform. Whenever possible, visiting nurses should be employed to attend cases in the houses of patients, and their visits should be so timed that the resident and the students may be present at the visit, observing her methods of work.

Champneys¹ earnestly endorses the action of the Obstetrical Society of London in advocating the education and examination of midwives, and the issuing to them of diplomas upon a satisfactory showing of their competency. The General Medical Council of England in 1893 declared that such a registration of midwives was desirable, as did also select committees of the House of Commons in 1892 and 1893. Champneys considers midwives a necessity, and claims that absence of examination and registration means widespread loss of life and health to mothers and children. [Midwives we regard as one of the relics of mediæval medical barbarism, and by no means a necessary evil. Rather than educating these women to be poor doctors, by a proper course of obstetric training in our medical colleges obstetrics will become more attractive to the medical students, and will in time no longer

¹ Med. Press and Circ., March 13, 1895.

be relegated to these parasites upon the profession. We cannot, therefore, endorse the action of our English brethren.]

Markoe and Lambert,¹ arguing from the basis that any gynecologic surgeon will acknowledge that the vast majority of the diseases of women coming under his care follow parturition as complication or as sequela, offer an ardent plea for an early and radical improvement in the methods of obstetric teaching. The standard of obstetric practice, they believe, should be, and can be, raised to such a point that gynecologic cases may come only from unavoidable causes, and not from the ignorance and neglect of obstetricians. They outline an ideal course of obstetric teaching, as follows: 1. Theoretic lectures, as given in the United States. This includes a didactic course profusely illustrated by diagrams, models, paintings, and pen-and-ink sketches, and seconded by collateral reading from the best textbooks by American and English authors, or good translations of recent German books. 2. The recitation system, as practised in the United States. This may form a part of the regular course or may be in the hands of quiz-masters, or it may consist in a private arrangement between the student and his instructor. 3. A manikin-course, as given in France, Germany, and very generally in America. The manikins of Schultze and of Budin are largely employed for this purpose. The work consists in the performance by the student himself of the various obstetric operations and manipulations under the direct supervision of the demonstrator. 4. A touch-course on pregnant women, as universally conducted in France and Germany, and as is at present coming into use in the United States. In Germany this is given by the first assistant under the direction and personal supervision of the professor himself. The teaching of Americans is particularly weak in this department. 5. Practical work in hospital wards, not limited to simple observation, but each student actually to carry on the labors and their subsequent treatment under rigid supervision. 6. Clinical lectures upon the same material, as given in France and Germany, but which are almost absolutely neglected in America. This course should include any case of dystocia or other case of pathologic interest occurring in the service, or the demonstration of any fetal malformation that may be encountered. 7. Polyclinic or out-patient department, as carried on in England and as now partially introduced into the United States. In France all the babies born during the week are vaccinated by the students. The students also, in Germany, render assistance to midwives in complicated cases occurring in their private practice.

The Physiology of Pregnancy.—*Demography.*—Theophilus Parvin² contributes a most interesting series of facts derived from the Philadelphia Board of Health, and including two periods of five years: The first, which may be called the preantiseptic period, embraces the years from 1868 to 1872, inclusive, and the second, 1888 to 1892, also inclusive. The entire number of births during the ten years brought in review is a fraction over 231,000.

¹ Am. Jour. Med. Sci., Nov. 1, 1894.

² Am. Gyn. and Obst. Jour., April, 1895.

In these Philadelphia births there was a fraction over 29 instances of triplets, and precisely 2625 cases of twins. The entire number of plural births was 2654. The maximum of births in that city occurred in the months of December, August, July, and October, the number being 81,985, and the minimum the period embracing February, June, May, and April, the number being 71,250. It follows that conception occurs most frequently in March, November, October, and January, and most rarely in May, September, August, and July. There is an extraordinary number of boys born in Philadelphia. During the first five years the relation of female to male births was 100 to 110, and in the second, 100 to 109; in one year, 1870, it was 100 to 113. The mortality of the infants has but slightly lessened. In the first period 266 of every 1000 children born died in the first year; in the second, 225. The deaths from puerperal infection per 1000 during the first five years, which was a preantiseptic period, are represented by 1.3, while in the latter 5 years, in which antiseptics has doubtless been more or less rigidly employed, the mortality is only 0.8 per 1000.

Migration of the Ovum.—As might be expected, the past year has shown but few additions to our knowledge of the physiologic processes of gestation. Probably the most important contribution is that of Lode,¹ who has investigated the interesting subject of the migration of the ovum to the tube in a series of experiments upon guinea-pigs. In one experiment he injected fine coal-particles into the peritoneal cavity. The animal was killed thirty-six hours afterward, and the coal-particles were detected in both tubes. In a guinea-pig four months old, in which the sexual organs were not yet fully developed, the particles were found only in the fimbria. In another series of experiments he used the ova of the *ascaris lumbricoides*, as they were larger than the coal-particles. The injections were made in the same way into the peritoneal cavity. The examination of the guinea-pigs killed within a variable period of from thirty-six hours to seven days showed the presence of the ova in large numbers in about the middle portion of the tubes. In a few instances the ova had become glued together, forming a round mass fully the size of the natural ovum of the guinea-pig. This was found in the same situation in the tubal canal. The author draws the following conclusions from his investigations: 1. The cilia of the tube of a guinea-pig have the power of setting in motion bodies the size of the ovum of the guinea-pig, providing that the animal has arrived at sexual maturity. 2. The tube is enabled to take up ova not only from the ovary, but also from the free peritoneal cavity. Hence the old theory may be discarded, that it is necessary for the tube to be applied to the ovary in order to engage the ovum within its canal. [The theory of transmigration—that is, the passage of the ovum from one ovary to the tube on the opposite side—receives new proof by the foregoing experiments.] 3. The migration of the ovum is independent of the menstrual period, as none of the animals experimented upon showed any signs of rut either while alive or postmortem.

¹ Archiv f. Gynäk., Bd. xlv. Heft 2, 1894.

4. The migration is not dependent upon coitus. 5. The ovum travels along the first part of the tube much more rapidly than along the remaining part of the tube.

Lode attributes but a small role in the propulsion of the ovum to the peristaltic movements of the tube. Heil¹ has likewise performed twelve experiments upon rabbits. Having opened the peritoneal cavity, he injected a solution of sodium chlorid containing powdered charcoal into the cavity. In some cases the injection was made into the whole cavity, in others into peritoneal pockets. In all of the experiments the results were similar. Minute particles in close proximity to the current of the cilia of the fimbriated end were swept into the infundibulum or into the tube, while corpuscles more remote were not affected. Ova, even if brought very near, remained unmoved. In conclusion, Heil thinks that proof is wanting of a constantly acting fimbrial current able to move ova lying on the peritoneum to the abdominal mouth of the tube, and he doubts also if this can be certainly established experimentally. Many impulses are to be considered in the migration of the ova. If the fimbria embrace the follicle, the case is very simple. If the ova escape near it in the narrow space between the end of the tube, ovarian capillarity, aided by the escaping fluid from the follicle, may drive the ovum into the tube. If the ovum falls into the general peritoneal cavity, it is usually lost, unless by chance it drops within the reach of the cilia or is floated thereto by the peritoneal serum.

Menstruation and Ovulation.—Leopold and Meronoff,² from a study of the relationship existing between menstruation and ovulation, summarize as follows: Menstruation is generally accompanied by ovulation, though it not infrequently occurs without the latter. This periodic flow of blood depends on the presence of the ovary and of a sufficiently developed uterine mucosa—two factors without the common action of which no typical outflow can occur; hence it does not depend on the maturity or rupture of a Graafian follicle. If either factor is wanting, no flow occurs, however sound the other may be. If ovulation has occurred, it may generally be referred back to the time of the hemorrhage. It requires for its development a strong efflux of blood to the genital organs for several days, and forms there a typical corpus luteum. Outside of the time of the four-weekly bleedings ovulation also occurs, but this is seldom under physiologic conditions. Ovulation and the formation of a typical corpus luteum may take place through determination of blood to an immature follicle. Even at the time of senile atrophy of the ovary normal follicles still occur, and these come to physiologic eruption, forming a typical corpus luteum. On the whole, menstruation is the more frequent, and menstruation without ovulation the more seldom. It is certain that at the time of periodic hemorrhage ovulation can occur, even when no external bleeding is observed.

Histology of the Amnion and Cord.—Lange³ presents a contribution to the

¹ Archiv f. Gynäk., Bd. xliii. H. 3, 1894.

² Ibid., Bd. xlv. H. 3, 1894.

³ Zeitschr. f. Geburtsh. u. Gynäk., Bd. xxviii. H. 1, 1894.

histologic anatomy of the amnion and umbilical cord in the human embryo. His conclusions are as follows: 1. The epithelium of the amnion is not cubic or cylindric, but is a single layer of pavement-epithelium. 2. The granulation of the dead amniotic epithelium does not depend upon the presence of fat. 3. In the amniotic epithelium there are no open mouths of lymph-passages. The pretended stomata are artificial, and arise through the rupture of degenerated mucus-cells. 4. The umbilical epithelium is, as a rule, a three-layered, seldom a four-layered or five-layered, laminated epithelium, the deep layer of which consists only of flat cells. 5. During embryonic life the differentiation into a laminated epithelium appears on the umbilical cord earlier than the division of the epithelium. 6. "Stomata" are not found in the epithelium of the umbilical cord. 7. The umbilical cord of a mature fetus contains numerous elastic fibers within the connective tissue. 8. The cord contains no other lymph-channels than the connective-tissue corpuscles of Virchow. 9. These capillary lymph-channels are most probably susceptible of injection. 10. Between the epithelial cells of the cord can be found no branches of lymph-channels. [These studies of Lange are especially valuable, since they materially augment our meager knowledge of these fetal structures. They open up a field of unparalleled interest and fecundity for original research.]

Method of Closure of the Ductus Arteriosus.—Strassman¹ reports his exceedingly interesting studies of the mechanism by which the closure of the ductus arteriosus is effected. He has demonstrated from the fifth month in the human fetus a progressive development of the angle made by the anterior wall of the duct at its junction with the aorta, which at term forms a valve that is held open by the current in the duct, but must close before any regurgitant current. He has found similar conditions in fetal sheep, dogs, and cats. The closure of the duct is a necessary consequence of the mechanic conditions that follow the first respiration. During fetal life the full force of the right heart is expended in maintaining the blood-current in the ductus arteriosus, and the valve remains open; but with the sudden expansion of the pulmonary arteries by the first respiration the pressure in the duct becomes much less than that in the aorta; the valve immediately closes, and the closure is maintained by the immediate establishment of the permanent excess of pressure in the circulatory system of the left heart, which is characteristic of extrauterine life. The closure is prevented—1. If the first respiration is insufficient; 2. If premature respiration (that is, respiration before the air has access to the mouth) occasions sufficient pressure in the duct to overstretch it; 3. In some abnormal conditions of pressure in the large vessels; 4. In cases of incomplete development. These conclusions are supported by postmortem injections both through the aorta and through the duct.

The Condition of the Patellar Reflex in Pregnant Women.—Neumann² has recently investigated this hitherto unnoticed condition. He has made observations upon 500 women, in most cases in pregnancy, labor, and the

¹ Archiv f. Gynäk., Bd. xlv. Heft 3, 1894.

² Centralbl. f. Gynäk., No. 8, 1895.

puerperium. In most of the pregnant patients he found the knee-jerk exaggerated, but in some it remained normal up to the beginning of labor. Doubtless many circumstances (age, parity, presentation of the fetus) had an influence on the state of the reflex. In parturient women with strong pains he found the patellar reflex regularly and quickly increased. It reached its highest point during the period of expulsion, and was often so much increased that it would have been regarded as pathologic under other circumstances. On the third or fourth day of the puerperium the knee-jerk was often already nearly normal.

The Diagnosis of Pregnancy.—Landau¹ [rightly] believes that the exact estimation of the beginning of pregnancy is not possible, as, apparently, ovulation occurs independently of menstruation. The size of the uterus is in the early months also an unsafe guide; the form and consistence of this organ are more reliable; it is enlarged evenly and in the transverse diameter, so that the ante flexion is increased, the vaginal portion is drawn up, the vagina elongated, and the anterior vaginal wall appears more tense than otherwise. The consistence is softer, the sensation being as though the examining finger were pressed in soft butter. Hegar's sign may be recognized in 30 per cent. of the cases. Usually the anterior uterine wall is more soft and more loose than the posterior wall, and this probably has some relation with the attachment of the placenta. Voituriez² records a case in which fetal movements were detected at the sixteenth week, four weeks before the usual time, in five successive pregnancies. He comes to the conclusion that the movements of the fetus occur at a very early date, probably before the seventh week, that they may be perceived objectively by the physician from the fourteenth to the sixteenth week, and that they may be recognized subjectively by the mother at the sixteenth week; hence may arise an error in the determination of the duration of pregnancy from this symptom. [This is an especially important fact to bear in mind, so strongly rooted is it in the minds of many medical men that quickening occurs invariably at the middle of pregnancy.]

The Hygiene of Pregnancy.—The care of the pregnant woman is ever an important and at times a perplexing question. Dewees³ insists upon the fact that the diseases peculiar to women in pregnancy and parturition are largely preventable, and that it is incumbent upon the medical attendant to give adequate instructions concerning the ill effects of improper posture, dress, food, drink, and erroneous habits of living, including the non-forbearance of indiscriminate excesses and sensual indulgences. It becomes his duty to discover if the patient be actually pregnant; to determine positively whether the pregnancy be uterine and normal, or tubal, abdominal, and abnormal; to carefully note the history, age, primiparity or multiparity, environments, station in life, general condition of health, period of gestation, dress, food, drink, habits of life; to make repeated examinations of the urine, and to ascertain the temperature from the time pregnancy is

¹ Deutsch. med. Wochenschr., No. 52, 1893. ² Arch. de Tocol. et de Gynéc., Aug., 1894.

³ Jour. Am. Med. Assoc., Sept. 29, 1894.

established to the termination of gestation; to make a physical examination for the purpose of accurately determining the pelvic diameters, the symmetry and size of the bony inlet and outlet, the integrity, condition, and position of the vagina, uterus, and other intrapelvic viscera and adjacent structures; the state of the abdominal muscles, the presence or absence of hernia, varicose veins, or tumors; the shape, size, and condition of the breasts and nipples, and the condition of the heart, lungs, stomach, bowels, and other organs; the mental condition; and, finally, to observe the state of the fetus, its strength and viability, as well as the implantation of the placenta. He should insist upon absolute regular hours and wholesome environments; upon a plain but nutritious diet; upon a proper amount of exercise by walking or light labor on foot, and maintaining the correct erect posture, with not less than ten hours' sleep out of every twenty-four; also, upon an open condition of the bowels and skin, which is to be chiefly maintained by proper diet, exercise, and bathing, the wearing of flannel, warm, low-heeled shoes, and loose garments, and, in rare cases, the proper use of laxatives and hot-water enemata. Urinalysis and thermometry are very important from beginning to end of pregnancy. Should the pregnancy be much extended beyond the normal period of duration, it then becomes his imperative duty to artificially terminate it. [There can be no more important subject than the proper management of the pregnant woman, and the routine examination as suggested by Dewees is admirable in its comprehensiveness and system. A more practical and valuable case-book for obstetric practice could not be devised than one based on some such plan as the preceding.]

Prolongation of Pregnancy.—Remarkable instances of partus serotinus are reported by Tarnier¹ and Resnikoff.² Resnikoff's case was a pregnancy of eleven months' duration in a somewhat anemic secundipara, with a true conjugate of ten centimeters. He had observed the case from the beginning of pregnancy, and when term was reached advised an artificial termination in vain. After a painful labor of twenty-four hours the woman spontaneously gave birth to a male child considerably macerated and decomposed. The placenta was closely adherent. Tarnier's patient carried the product of conception *in utero* forty days after term. The fetus was macerated, but not putrid, and the placenta was in a state of fibrofatty degeneration.

PATHOLOGY OF THE FETAL APPENDAGES.

The Placenta.—*The Absorptive Power of the Placenta.*—The passage of foreign substances through the placenta has been investigated by Porak³ and by Chambrelant and Subrazes.⁴ Porak concludes that it is by the intermediation of the placenta that poison is transmitted to the fetus; it constitutes the organ of material changes between mother and fetus; it plays the parts of the lung, intestines, and kidneys, and in accumulating poisons its

¹ Jour. des Sages-femmes, May 1, 1894.

² Centralb. f. Gynäk., No. 24, 1894.

³ Nouv. Arch. d'Obstét. et de Gynécol., No. 3, 1894.

⁴ Jour. de Méd. de Bordeaux, 1895.

function approaches that of the liver. He found that mercury showed great affinity for the placenta, and that lead and copper accumulated most in the fetus, while arsenic was found chiefly in the liver of the mother and in the skin of the fetus. Poisons are accumulated and become diffused in the fetus more rapidly than in the mother. Dead births and polymortality of the young following metallic poisoning are explained by the accumulation of the poisons in the placenta and nerve-centers, with corresponding effect upon the placental circulation. With copper and lead, abortion was not observed, but death of the young before birth was common, or else the mother died undelivered. Mercury has the power of producing abortion. Lead-intoxication displayed itself in the young by producing cerebral lesions and paralysis; arsenic produced abortions from placental hemorrhages. [It is important to note that if the placenta is frequently and gravely attacked by syphilis, it is at the same time the elective organ of accumulation of mercury.] The accumulation of lead in the cerebral nervous system of the fetus accounts for the gravity of saturnine encephalopathic accidents. The presence of arsenic in the skin of the fetus only explains its therapeutic action in cutaneous diseases. Chambrelant and Subrazes inserted into the ears of a pregnant rabbit a bouillon-culture of the streptococcus. Some time after, pure cultures of the streptococcus were obtained from the heart, blood, liver, and spleen of the mother and from the interior of the embryos. The embryos were the size of lentils and about twelve days old. They were infected with chains of streptococci, as was shown by the examination of sections after hardening in alcohol and staining with picrocarmin. [The treatment of the fetus through the medium of the fetoplacental circulation has long been recognized as a valuable form of fetal therapeutics. These experiments are valuable as suggesting the varying affinities of certain drugs for the placental circulation, and may therefore be important aids in the management of fetal morbid processes.]

Placental Tuberculosis.—Lehmann¹ demonstrated before the Berlin Medical Society a placenta in which there were areas of tubercular inflammation containing tubercle-bacilli in abundance. The placenta came from a woman who was suffering from chronic pulmonary tuberculosis, and whose child had died ten days after birth, but without lesions of tuberculosis. [The presence of the lesions and of the bacilli in the placenta clearly shows a mode of direct transmission of the infectious material from mother to fetus, which is probably more frequent than has been supposed.] Lehmann remarks that the changes in the placenta are so slight that they may easily be overlooked: in order to discover them the placenta should be cut in slices one-half centimeter thick, each portion carefully examined, and doubtful portions examined by the microscope.

Placental Tumors.—Alin² observed an interesting case of multiple solid placental tumors, one being the size of a hen's egg and another the size of a walnut, the former being situated in the marginal portion and the latter

¹ Deutsch. med. Wochenschr., No. 4, 1894.

² Warfoinge's Festschrift, 1894, p. 217.

in the center of the placenta. Both tumors were composed of numerous smaller tumors varying in size from the head of a pin to that of a hazelnut. They were found to consist of capillary vessels surrounded by scanty connective tissue with few cells. There was no trace of a sarcomatous structure. The endothelium of the vessels consisted of a single layer of well-defined cells, coloring easily. Alin regarded the tumors as due to hypertrophy of the chorionic villi with abundant vascularization. [This neoplasm was probably analogous to the deciduoma malignum or to the sarcoma deciduocellulare of Sänger. Alin has neglected to state his views as to the malignancy or non-malignancy of the tumors.]

The Deciduæ.—*Hydrorrhea Gravidarum*.—Chazan¹ remarks that there are three principal sources of the fluid that occasionally escapes from the uterus during pregnancy. These are, the uterine wall—a true serous infiltration existing—the space between the fetal membranes, and the sac of the amnion. Hennig and Schröder believe that the fluid collects between the chorion and the decidua, while Kaltenbach and others consider that it lies between the opposed surfaces of the decidua vera and reflexa. [The fact that the escape of fluid often begins in the third or fourth month, at a time when, under normal conditions, the two decidua have not united, supports the views of Kaltenbach. In the early period of pregnancy a space is found to exist between the decidua vera and the decidua reflexa, that ordinarily contains only a little mucus, but that might become distended with fluid by hypersecretion from the decidua or by hemorrhage. In recorded cases there has been no direct evidence produced that union had not taken place between these decidua; but this seems to be the probable explanation of the fact that the greatly thickened vera has been sometimes separately expelled after the placenta. The nature of the pathologic process that causes decidual hydrorrhea is still obscure. Braun emphasizes the existence of previous endometritis with exudation. Hegar considers the morbid process to be of the nature of hypertrophy of the decidua, especially of its glands. Scanzoni believes it to be due to transudation dependent upon the condition of the blood. Zini regards the fluid as an extravasation resulting from the hyperemia and increased vascularity of the uterine mucosa. Chazan is inclined to refer it to the periodic congestion of the genital organs occurring during pregnancy. Duges and Jörg indicate the allantois as a possible source of the fluid in hydrorrhea. It is well known that in many instances the amnion and chorion, instead of being glued together by an amorphous tissue, are separated by a collection of fluid, so that two sacs are present in the afterbirth. It may be that these so-called “forewaters” can escape during pregnancy, and thus explain some cases of hydrorrhea, but this cannot be proved, because we know no sign by which these waters may be distinguished. Döderlein has proved that in a case observed by him the forewaters could not be chemically distinguished from the liquor amnii.] There still remains that form of hydrorrhea in which the true liquor amnii escapes

¹ Centralbl. f. Gynäk., No. 5, 1894.

during pregnancy, and of this variety Chazan records a case. [The theory that is now largely accepted as to the etiology of the hydrorrhea of pregnancy is that it is a result of a deciduitis proceeding from a preexisting endometritis, and aggravated, it may be, by the hydremia natural to pregnancy.]

In regard to the treatment of hydrorrhea, Williams¹ remarks that to simple hydrorrhea no concern need attach; all that is necessary is the making of the proper diagnosis and the assurance to those interested that at the proper time all will be well. If the condition be due to cystic degeneration of the membranes, the position taken must be tentative, with a constant watchful care for impending danger. It is probable that uterine contractions will be set up and the fetus expelled. When fetal vitality ceases, nothing is gained by waiting, and the uterus should be emptied.

The Chorion.—*Cystic Degeneration of the Chorionic Villi.*—Cystic disease of the chorionic villi, giving rise to the so-called "hydatid" or "vesicular moles" or "uterine hydatids," is a very rare condition. In the formation of the cysts Kennedy² remarks that the epithelium of the villi is first affected. The connective tissue undergoes a remarkable proliferation and collects at particular spots, the rest of the villus remaining unchanged. By the growth of these elements each villus becomes distended, and many of the cells liquefy. The fluid thus produced separates the connective tissue and forms a network in the interior of the villus; in this way are formed the peculiar grape-like bodies that characterize the disease. When once the degeneration has commenced, the diseased tissue increases remarkably fast. The altered chorion maintains its nutrition by its connection with the decidua. It is a much-disputed question as to whether the child or the mother plays the more important part in the production of the disease. Some suppose it to follow the death of the fetus; then the entire developmental power is expended on the chorion, which retains its attachment to the decidua, the result being abnormal growth and cystic degeneration. Graily Hewitt and Greise hold this opinion, and their view is strengthened by the fact that in almost all cases the fetus has entirely disappeared, and also by the occasional occurrence of twin conceptions in which one chorion has degenerated, the other remaining healthy until term. Others, among them Virchow, claim a maternal origin, or ascribe it to some blood-dyscrasia on the part of the mother, such as syphilis. According to this view, the death of the fetus is secondary, the consequence of impaired nutrition from the morbid state of the decidua. Kennedy [very correctly] inclines to the belief that both of these views may be correct, the one operating in one instance and the other in another.

Kehrer³ has collected the records of fifty cases of hydatid moles. From his investigations he concludes that the disease is most frequent in the latter portion of the child-bearing period, 22 per cent. occurring in the fourth and fifth decennia. This accords with the observations of Bloch, Louis Meyer,

¹ Med. News, March 30, 1895.

² Univ. Med. Mag., July, 1894.

³ Archiv f. Gynäk., Band xlv. Heft 3, 1894.

Schröder, and others. Kehrer remarks that vesicular moles are observed in four different forms: 1. *Mola hydatidosa incipiens*.—This forms a cyst corresponding in size to an ovum of the third or fourth month of gestation, consisting of an amnion and a chorion, upon the surface of which there are numerous vesicles. The embryo is either entirely absent or some of its fragments float in the liquor amnii. The umbilical cord may be absent or present. 2. *Mola hydatidosa partialis*.—In these cases the fetal membranes and the placenta are normally developed, but some of the placental villi are surmounted by vesicles, or parts of the placenta are changed into bands or plaques of vesicles. The branches of the umbilical artery leading to these degenerated villi are obliterated. The fetus is often living, sometimes normally developed, sometimes stunted in its growth. 3. *Mola hydatidosa totalis*.—Here the ovum is a mass of vesicles surrounded by a decidua perforated in numerous places. Remnants of fetal membranes are sometimes found in the midst of the vesicles. Of the fetus no trace is left. 4. In this group of cases twin pregnancy exists. One ovum is normally developed; the other one is a shapeless mass of myxomatous villi. Besides the one case of this variety observed by Kehrer eleven are reported by various authors. [This classification of Kehrer is probably the best and most trustworthy yet suggested. The extreme rarity of the disease or the failure on the part of obstetricians to recognize the condition or to report the cases when encountered has contributed largely to our comparative ignorance of the cystic chorionic degeneration.]

Sarcoma of the Chorionic Villi.—Gottschalk¹ contributes an exhaustive article relative to sarcoma of the villi of the chorion. The disease appears some weeks after an abortion, with symptoms of irregular and severe hemorrhages alternating with serous discharges. Recurrent curettage of the uterus gives no permanent relief, but reveals masses of dark-red or brown club-like bodies. These masses are tufts of altered chorion that extend deep into the muscular wall, so that the finger can easily advance through the softened wall, and a curet could readily pass through. It seems as though no musculature remained at the placental spot. Violent cough and vomiting present themselves, but rarely fever. No treatment save total extirpation of the uterus is of any use, early operation being necessary. Immediately after removal of the uterus the cough and vomiting cease, but may later return, and as metastatic growths are found in the brain, this second onset may be cerebral in origin. Foci of disease may also be found in the lungs. Timely removal of the uterus may add six months of comfort to the woman's life. Examination of the uterus after section gives evidence of a very malignant large-celled new growth of the placental tufts, involving both the stroma and epithelium. This rapidly leads to metastatic foci by means of the blood-vessels, these foci agreeing with the primitive formations, and, like these, they consist of agglomerations of malignant tuft-masses. The diagnosis is based on the microscopic examinations of the removed uterine contents.

¹ Archiv f. Gynäk., Band xlv. H. 1, 1894.

Club-shaped, tailed, or large cells, with giant nuclei that swell under chromatin, and taking the place of the cells of the normal villous stroma, indicate surely this disease. If in a suspicious case *one* of these altered tufts be found, the uterus should be removed at once.

THE PATHOLOGY OF PREGNANCY.

Salivation.—An exceedingly interesting case of this rare condition is reported by Green.¹ The woman came under observation in her twenty-seventh year, during her first pregnancy. She had not suffered from nausea and vomiting, but early in the gestation began to be troubled with excessive salivation. This symptom gradually increased in severity, and was especially disturbing at night. Finally the flow of saliva became so profuse at night that the patient was unable to lie down for fear of choking. The general health was good. The submaxillary glands were markedly enlarged and the contour of the face thereby distorted. All the drugs recommended for excessive salivation had been employed without effect. The urine was materially diminished in quantity. Labor was terminated by forceps, whereupon, within a few days, the salivation ceased. Two years later, in a second pregnancy, salivation again appeared at the end of the second month, again without the morning sickness, and by the fifth month it had become excessive. After an instrumental labor at term there was a continuance of the salivation for two weeks, after which it gradually disappeared.

Pernicious Vomiting.—As regards the so-called physiologic vomiting of pregnancy, Giles² estimates that one-third of all pregnant women are free from morning nausea during the entire pregnancy, and 45 per cent. remain free from it during the first three months. One should not, therefore, place great weight upon the presence of this sign. If it occur, it presents itself in 70 per cent. in the first month of pregnancy, seldom in the second, third, and fourth months, and almost never in the fifth and sixth months. In about from 9 to 10 per cent. it begins first in the last three months. The vomiting of pregnant women arises from an increased nervous excitability, some local source of irritation, and from a rapid conduction of the nervous energy. The causes of the pathologic form are multiple. Most frequently it may be attributed to a pathologic condition of the uterus. Davis³ remarks that the nausea and vomiting of pregnancy are dangerous in proportion as they induce pernicious anemia. While it is possible that sudden and radical improvement may occur in cases in which a functional neurosis is the predominant factor, only when pernicious anemia is once established is delay dangerous, no matter at what period of pregnancy the patient is seen. In the treatment of milder cases Lutaud⁴ recommends cocaine, 10 drops of a 1 or 2 per cent. solution, repeated at one-hour or two-hour intervals. Occasional success will follow Routh's procedure, which consists in exposing the uterine neck by means of a speculum and painting with tincture of iodine.

¹ Boston Med. and Surg. Jour., April 12, 1894.

² Univ. Med. Mag., March, 1895.

³ Med. News, June 2, 1894.

⁴ Atlanta Med. and Surg. Jour., Jan., 1895.

Five drops of an equal mixture of tincture of iodine and chloroform may be tried night and morning at meal-times. It is said¹ that a single vesication over the fourth and fifth dorsal vertebræ never fails to correct the condition. In incoercible vomiting premature expulsion of the fetus must be provoked as soon as possible. [The common error is to postpone until too late the premature termination of the pregnancy. It is, we confess, an exceedingly difficult matter to decide just when this procedure is indicated in any given case, but it is preferable to err on the side of maternal safety rather than to lose both the mother and the fetus.]

Infectious Diseases in Pregnancy.—Klautsch² asserts that the premature expulsion of the product of conception in the course of an infectious disease complicating pregnancy results from the disturbance of the maternal temperature and circulation, as well as from a participation of the endometrium in the pathologic process. Remy³ favors the latter cause, and reports a case of abortion at five months and ten days occurring during a mild attack of measles. The fetus was expelled *en bloc* in the membranes, and lived for a few moments. The mother made a good recovery. Remy suggests that measles may act upon the uterine mucosa as it does on that of the eyes, nose, pharynx, and bronchi, causing an inflammatory congestion similar to that occurring in variola. The abortion occurred in his case at an earlier stage of the attack of measles than in most of the scanty number on record. Touvenaint⁴ reports a case of ataxo-dynamic typhoid fever at the seventh month of gestation, resulting in premature birth of the fetus, which survived, and in death of the mother.

Guensbourgue⁵ claims that pregnancy does not delay the progress of pulmonary tuberculosis, but rather hastens it. The same view is held by Müller, who adds that in tuberculous women the accouchement is complicated by uterine inertia and hemorrhage. Lactation seems even more injurious than pregnancy to the tuberculous. Lehmann⁶ reports a case of tuberculosis in a woman forty years of age, who died on the third day after giving birth to a male child. The child died when twenty-four hours old. There was serous effusion into the pleuræ and pericardium, ecchymoses on the latter, and a tuberculous deposit in the walls of the left ventricle. The valves were healthy. The lungs and the bronchial, mediastinal, hepatic, mesenteric, and lumbar lymphatic glands were tuberculous, as was the left kidney. The peritoneum, right kidney, suprarenal glands, brain, and meninges appeared normal. Bar and Thibierge⁷ have observed the influence of pregnancy upon existing lupus in thirteen cases. During the course of the pregnancy the lupus in each case returned, but immediately upon the return of the menses disappeared. [The old view of the beneficial effect produced by pregnancy upon tuberculosis is, fortunately, rapidly being dispelled, and the moral

¹ Canad. Pract., Dec., 1894.

² Arch. de Tocol. et de Gynéc., June, 1894.

³ Arch. de Tocol. et de Gynéc., March, 1894.

⁴ Münch. med. Woch., Dec. 25, 1894.

⁵ Jour. de Méd. de Paris, July 8, 1894.

⁶ Berl. klin. Woch., July 9, 1894.

⁷ Gaz. méd. de Paris, No. 52, 1893.

question involved in the marriage of consumptives is being more generally recognized. The foregoing reports are encouraging proofs of the truthfulness of this assertion.]

Retroversion of the Gravid Uterus.—Tarnier¹ teaches that, as a rule, it is best to keep a pregnant woman with retroversion at rest. The urine should be drawn off with the catheter several times daily, and the bladder, being thus constantly kept empty, no longer presses upon the uterus, which can rise to its normal position. [While such an expectant plan of treatment may meet with success in a certain proportion of cases, by far the safer method is the immediate manual or postural replacement of the organ and its retention in proper position by some form of mechanic support.] A sacculated pregnant uterus occurring in the later months of gestation, and which has been described under various names—*e. g.* retroversion of the gravid uterus at term, sacciform uterus, and sacculated uterus—is, according to Croom,² by no means a frequent occurrence; he has, however, recently encountered four such cases. He considers that the main difficulty is to differentiate this form of uterus from a sessile ovarian tumor, and where the auscultatory sounds are wanting, as occurred in two of his cases, the difficulties are practically insurmountable, because it must be borne in mind that the abdominal portion of the uterus is much more fixed than usual, and is generally more or less deflected to one or the other side.

Vulvar Vegetations.—Porak³ urges the necessity of removing during pregnancy warts developing exuberantly on the vulva, in order to avoid infecting the fetus with purulent ophthalmia. He also cited a case to prove the fallacy of the idea that warts disappear spontaneously after pregnancy. In the case in question they persisted unchanged for two months after labor, and were finally removed under chloroform. [If this treatment be adopted, it should be only near the termination of pregnancy, in order to avoid a premature expulsion of the fetus.]

Carcinoma of the Pregnant Uterus.—Hernandez,⁴ having made a study of the statistics of this rare complication of pregnancy, including his own experience, is convinced that nothing but early operation can ensure anything approaching a definite cure; but, whatever the stage of gestation, the uterus and appendages should be removed at once. Vaginal hysterectomy should be performed if the patient is less than four months pregnant; after this period Mackenrodt's abdominal hysterectomy is to be preferred. Before the seventh month the uterus is to be removed at once; if the child is viable, Cesarean section should precede the hysterectomy. When the carcinoma is beyond hope of successful removal, the interests of the child must first be considered, and the surest way of saving it chosen. Hernandez urges a more careful search for uterine carcinoma in pregnant women, and when the diagnosis is doubtful he insists that the microscope should be employed.

¹ Jour. des Sages-femmes, Oct. 16, 1894.

² Edin. Med. Jour., Oct., 1894.

³ Bulletins et Mémoires de la Soc. Obstét. et Gynéc. de Paris, Oct., 1894.

⁴ Archiv. d'Obstét. et de Gynéc., Sept., 1894.

Nephritis and Albuminuria.—Herman,¹ at a meeting of the Obstetrical Society of London, presented the histories of six cases of nephritis occurring during pregnancy and labor. From the comparisons of these histories and of others published in the Society's Transactions he concludes that there are at least two kinds of renal disease to which a pregnant woman is especially liable. One of these is a very acute disease in which premonitory symptoms are either absent or of duration measurable by hours or days. It attacks chiefly primigravidae, and often causes intrauterine death of the child. The foregoing form of the disease is also attended with extreme diminution in the quantity of urine, the small amount that is passed being greatly deficient in urea, but containing enough albumin to make it solid on boiling. This form of disease is accompanied with rapidly recurring fits; but if it runs a favorable course, the fits cease and the urine increases in amount, the percentage of urea rising therein. If the excretion of urea is not reestablished, the case quickly ends fatally. Such cases seldom, if ever, pass into chronic nephritis. The other is a disease that attacks older subjects, chiefly those who have previously had children. Its premonitory symptoms extend over a period of weeks or months, and often lead to the intrauterine death of the fetus. This form of the disease is generally accompanied by increase in the quantity of urine, with copious loss of albumin, but not so much in proportion to the urine as in the more acute disease, and with diminution in the elimination of urea, but not to such a degree as in the more acute form. Delivery is followed by temporarily increased diuresis and increase in urea-elimination. The elimination of urea continuing low, this form may pass into chronic nephritis. The presence of albuminuric retinitis affects the prognosis unfavorably. When the pressure within the abdomen is greater than usual, the amount of urine may be diminished, but in such cases the diuresis and augmentation of the urea-elimination after delivery are proportionally greater. In the acute disease, which causes eclampsia, and in the chronic disease when it is associated with excessive intraabdominal pressure, much of the albumin is paraglobulin. The cases in which the albumin is mainly serum-albumin generally end fatally or pass into chronic nephritis.

In the treatment of the albuminuria of pregnancy Huchard² insists that at the moment when a trace of albumin is found in the urine of a pregnant woman she should be placed at once upon an absolute and exclusive milk-diet until such time as the albumin has completely and definitely disappeared. If there is need of a purgative, it is better to prescribe calomel. If the patient is one who has passed albumin in preceding pregnancies, the milk-diet should be used as a preventive of albuminuria. Nor should it be forgotten that there may be an autointoxication even in the absence of albumin; therefore, when more or less marked symptoms of toxemia arise, as headaches, vertigo, nausea, visual and auditory phenomena, and especially dyspnea without apparent cause, this diet should be immediately prescribed. The woman attacked by the albuminuria of pregnancy most certainly ought

¹ *Lancet*, Jan. 13, 1894.

² *Jour. des Praticiens*, No. 1, 1895.

not to travel; the phenomena of genitourinary excitation, that are normally produced by the jarring of a railway journey, can readily in these cases, when an old or a subacute congestion of the kidneys exists, render the organs impermeable and promptly induce fatal results. Beyond this, repose, absolute or relative, is essential, and no drugs should be prescribed.

[All the writers of the year agree that in advanced cases of albuminuria of pregnancy the induction of premature labor is the proper mode of treatment. The child is sacrificed, but its chances of survival in the presence of eclampsia, or even of severe albuminuria, are very small; so that this fact cannot and should not be allowed to weigh in the balance. In case of the development of albuminuric retinitis the longer the case is allowed to go the greater is the damage done to the delicate structures of the eye, and the greater are the risks of permanent impairment of vision. There remains, as an additional reason for adopting this course, the fact that even in women who either do not have, or who survive, the eclampsia the kidneys do not always recover from the disturbance to which they have been subjected, and the patient not infrequently remains the victim of chronic nephritis.] Concerning the effect of albuminuria upon fetal life Oui¹ has recently observed 12 cases, in all of which the children were born in bad condition, only 5 of them surviving. In 6 the death was directly traceable to the toxemia. In 4 cases multiple hemorrhages had occurred into the placenta. Chaleix lays stress on the importance of diuresis for the elimination of the toxins. In his hands the hypodermic injection of the physiologic salt-solution in large quantities has, in conjunction with the use of milk given through a stomach-tube when the patient was unable to swallow, proved of marked service in desperate cases. The quantity of urine was increased thereby, and both the maternal and fetal condition improved.

Maternal Impressions.—With the object in view of arriving at some definite conclusions as to whether or not maternal impressions may deform the child *in utero*, Work² sent to a few physicians whose deliberate opinions on any subject cannot be lightly regarded, the following questions: 1. Do pronounced impressions made upon the mind of a pregnant woman predispose to bodily defects and birthmarks in the child? 2. Do such impressions influence the mental development of the child? 3. If, in your opinion, bodily or mental defects are thus produced, which of the emotions most frequently cause these defects? The first two questions were answered in the affirmative by Doctors R. A. F. Penrose, William Goodell, Louis Starr, Matthew D. Mann, Barton Cooke Hirst, P. R. Thombs, A. T. King, W. A. Edwards, Frank P. Norbury, and F. E. Waxham, and negatively by Doctors M. P. Hatfield, Jesse Hawes, and E. Fletcher Ingals. Fear seems to be the emotion most likely to result in the infantile defect. From a study of the scanty (reliable) literature on the subject Work draws the following conclusions: 1. That both physical and mental defects follow maternal mental impressions with such frequency as to establish the relationship of cause and

¹ Jour. de Méd. de Bordeaux.

² Med. News, Oct. 27, 1894.

effect. 2. That these conditions are the result of changes in the blood, chemie, circulatory, or both, seems probable. 3. That the probability of defects in the fetus, from mental causes, is dependent upon the "mental habit or mental characteristics" (Norbury) or susceptibility of the mother. 4. That maternal anticipation of defect in the child has in itself no influence in the absence of a strong impression. 5. That the impression need not be lasting to cause defects. 6. That personal maternal injury is no more likely to mark the child than the sight of it in another. 7. That the defect is not necessarily similar in location or appearance to the object creating the impression, but is likely to be. The apparent constancy of likeness is due to the reporting of such cases only. [These conclusions of Work, based as they are upon such weighty authority, must be recognized as definitely proving the possibility of fetal defects arising from this unusual cause. Hitherto the subject has been largely shrouded in mystery and popular superstition.]

Relaxation of the Sacroiliac Synchondroses.—Braun¹ remarks that relaxation of the pelvic symphyses is best marked in young multiparæ, the mobility being less in primiparæ. Yet in very young primiparæ, especially when of fair complexion, the mobility may be marked. It is least in elderly primiparæ. He has found the symphyses as movable in young primiparæ as when symphysiotomy has been performed. [This must be exceedingly rare.]

Mollities.—Neumann² claims that the excretion of calcium by the kidneys in the progressive stage of mollities is much the same as in health. During the second stage, that of osseous regeneration and recovery, less calcium escapes through the kidneys, but rather more in the feces. In a case coming under his notice a slight relative loss of magnesium occurred during the progressive stage, while, on the other hand, that salt was eliminated in less than the normal amount during the second stage. The normal relation of calcium to magnesium in the excreta (1 to 3) was altered, the latter earth diminishing in amount. The loss of phosphoric acid during the progressive stage was found to be marked and continuous, and that compound was evidently retained during recovery.

Valvular Disease of the Heart.—Vinay³ believes that too much danger is generally thought to exist when a pregnant woman has heart-disease. He divides such cases into three classes: First, those in which the cardiac affection, latent before fecundation, continues so during pregnancy and labor, and after labor. These cases are without a doubt more numerous than has been admitted up to the present time. A second class is composed of cases in which the function of the heart is only slightly disturbed for the first time during pregnancy. Without being as favorable as for the first class, the prognosis remains benign, because the cardiac insufficiency is only slight, and may be attenuated by rest in bed and medical treatment, and the accidents disappear after labor is over. The third class are those cases in which all the cardiac symptoms due to gestation appear, and a fatal end arrives at a time more or

¹ Centralbl. f. Gynäk., No. 20, 1894.

² Archiv f. Gynäk., vol. xlvii., part 2, 1894.

³ Jour. de Méd. et de Chir., Feb. 10, 1894.

less far from the moment of conception. It is easy to see that this last class has especially attracted attention, and made physicians conclude that there is always aggravation of the heart-lesions during gestation. The presence or absence of albuminuria is an important element in the prognosis. Its presence in the urine of a cardiopath always indicates an advanced insufficiency of the myocardium and a fault in compensation; and in pregnant women particularly its significance is unfortunate on account of the effect on the functions of the heart itself. Sears¹ also believes the importance of the complication of valvular heart-disease is overestimated, but urges the immediate induction of abortion in all cases giving rise to marked symptoms. The sooner this is done the better, while the fetus is still small and the expulsive force is chiefly furnished by the uterus.

Placenta Prævia.—Cumston² regards sudden syncope from the profound anemia created by the repeated hemorrhages as the most frequent cause of death in placenta prævia. Owing to the extreme weakness induced by the bleeding during pregnancy, the simple shock of labor may suffice to produce death; the sudden depletion of the uterus, sudden movements or change of position, may also be followed by sudden death. Cumston also states that in profound anemia chloroform itself may produce a fatal syncope. Heuck³ describes a case of air-embolus with fatal termination in a case of placenta prævia. Under narcosis, version was attempted, and a foot seized and brought down to the vulva; at this point the woman had a violent pain, bore down heavily, and a thick stream of bloody water spurted from the vagina; immediately the radial pulse failed, there was a gradual failure of respiration, and death followed in about five minutes. Freudenberg⁴ states that three such deaths have been reported from the Berlin Klinik during the last six years; he urges that sudden escape of the liquor amnii be prevented as far as possible, in order that there may follow a regular contraction of the uterus.

In the treatment of placenta prævia Cumston⁵ gives the following directions for the preparation of the tampons: Sterilize good absorbent cotton by placing in a sterilizer and boiling for ten minutes, and draining in a sterilized, perforated steel box for twenty-four hours. Having sterilized the hands, make the cotton into tampons, and place about forty in a medium-sized sterilized glass jar. Pour into the jar the following solution: Iodol, 10.0; absolute alcohol, sufficient for a perfect solution; and glycerol, 200.0. Before introducing the tampons into the vagina, cover them with a thin layer of 3 per cent. carbolized vaselin, which forms a sort of cement not penetrated by blood. Insert fifteen or twenty of these tampons, about the size of a walnut, into the vagina, in such a way that the cavity is transversely dilated and reaches the walls of the pelvis.

¹ Boston Med. and Surg. Jour., March 15, 1894.

² Annals of Gyn. and Ped., Sept., 1894.

³ Zeitschr. f. Geburtsh. u. Gynäk., Bd. xxviii. H. 1, 1894.

⁴ Centralbl. f. Gynäk., No. 20, 1894.

⁵ Loc. cit.

In six cases of placenta prævia A. Dührssen,¹ privat-docent of obstetrics in the Medical Faculty of Berlin, has successfully employed Maurer's method of dilatation. This consists in the introduction into the cavity of the uterus, after artificial rupture of the membranes, of a rubber bag or colpeurynter (Barnes's), which is afterward distended with water and maintained in close contact with the lower segment of the uterus by means of permanent traction on the tube. This variety of intrauterine plugging invariably arrests hemorrhage from the placenta, and permits of dispensing with combined version after Braxton Hicks's method, an operation presenting the double inconvenience of being difficult to execute for one who has not an extensive obstetric experience and of being attended with excessive fetal mortality (60 per cent. according to Dührssen). The quantity of water needed to distend the bag varies between 500 grams and a liter (1 to 2 pints), but half a liter is usually sufficient. When once the colpeurynter has passed the os the cervix will oppose no serious obstacle to the extraction of the fetus.

Philander A. Harris² describes a manual method of affecting rapid and very extensive dilatation of the os uteri for parturient purposes, and especially valuable in placenta prævia. The woman having been anesthetized, it is generally an easy task to insert the index finger to its largest diameter, the hand having followed in the vagina. If the finger now be withdrawn so that its tip merely enters the os, it will usually be found possible to introduce beside it the tip of the thumb. When the tips of both index finger and thumb are thus within the ring, and the second finger sharply flexed, with the os resting on its palmar and inner laterodorsal aspect, the index and second fingers must be kept close together to form a notch, from which the os-uterine ring cannot easily escape. For purposes of description and reference this is termed the first position for manual—or what might perhaps be more correctly termed *digital*—dilatation. The straightened and extended thumb, resting on the outer lateral side of the index finger, is now carried as far from the tip of the index finger as the enlargement of the os will permit. Considerable power for dilatation may be exerted by continuing this movement of the thumb, but a much greater and far less fatiguing force may be exerted if the thumb be implanted and held immovably on the index finger whilst forcibly and together flexing the index and second fingers. When a little headway has been thus gained the index and second fingers are slightly extended, which will permit the extended thumb to travel farther from the tip of the index finger, at which point the extended thumb is again pressed and held firmly against the outer side of the index finger. In this position the holding point is again taken, whilst tonic flexion of the index and second fingers continues the work of dilatation. After a time the fingers are again slightly extended, which will permit the thumb to be carried still farther toward the metacarpophalangeal articulation. Whilst holding it firmly on the index finger, flexion of the index and second fingers should be renewed. If tonic flexion

¹ N. Am. Pract., Sept., 1894.

² Am. Jour. of Obst., vol. xxiv. No. 3, 1894.

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Method of performing Rapid Manual Dilation of the Os Uteri.

FIG. 1.—Position of fingers in the beginning of manual or digital dilation of the cervix uteri—first position.

FIG. 2.—Showing limit of dilation in the first position.

FIG. 3.—Second position.

FIG. 4.—Showing limit of dilation in the second position.

FIG. 5.—Third position.

(From new photographs specially prepared for this article by Dr. Philander A. Harris of Paterson, N. J.)

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Method of performing Rapid Manual Dilation of the Os Uteri.

FIG. 6.—Limit of dilation in the third position.

FIG. 7.—Fourth position.

FIG. 8.—Limit of dilation in the fourth position.

FIG. 9.—Fifth position.

FIG. 10.—Sixth position.

(From new photographs specially prepared for this work by Dr. Philander A. Harris of Paterson, N. J.)

of the fingers has been steadily maintained, the index and second fingers and thumb may now be introduced. This is termed the *second position*. The relation of the extended thumb to the first finger is maintained as in the *first position*, whilst the os, encircling the thumb and also the two fingers, rests upon the dorsal surface of the more sharply flexed third finger, in the same manner as it rested on the second finger in the first position. The power for stretching, too, is derived from flexing the second and third fingers in the manner described for the first position, whilst the point of counterpressure is the thumb and first finger in positions of extension. In a short time sufficient dilatation will have been accomplished to permit the introduction of the third finger, which will constitute the *third position*. The os, still hooked over the tip of the extended thumb, will now have its point of counterpressure between the third finger and the inner laterodorsal aspect of the fourth finger. Again tonic flexion of all the fingers is resorted to, and the gain is taken up by occasional slight extension of the fingers and movement of the extended thumb toward the metacarpophalangeal articulation of the index finger. The introduction of the thumb and all the fingers will shortly be possible, thus constituting the *fourth position*. Here again the enlargement is effected by flexion of all the fingers, although the index and second will be flexed far less than the third and fourth fingers. The limit of dilatation in the fourth position for a hand measuring $7\frac{3}{4}$ inches over the metacarpophalangeal articulation (as measured for gloves) is $8\frac{1}{2}$ inches (circumferential measurement). The extreme limit of possible and easy dilatation in the fourth position will not exceed the glove measurement more than one inch, which is scarcely sufficient for the easy introduction of the whole hand. The *fifth position* is then resorted to, in which the os is made to encircle the first row of phalangeal bones of the fingers and the second or last phalanx of the thumb. The movement required in this position is extension of the thumb and all the fingers, the tips of the fingers being at the same time flexed to lessen their encroachment on the intrauterine space. A less fatiguing and somewhat more powerful dilating manipulation is the *sixth* and last position, which is effected by causing the os to encircle the second row of phalangeal bones of the fingers and the first phalanx of the thumb. In either the fifth or sixth position the degree of circumferential dilatation possible will exceed the glove measurement by at least three inches. This, of course, is a much greater enlargement than is required for the introduction of the hands into the uterus. When the tips of the index finger and thumb are in the *first position* for dilatation, the very slightly enlarged os will feel like an inelastic ring, and the tissues composing it will approximate in size the coil of wire as seen in the first position. [The original methods of *accouchement forcé* have been attended with such unsatisfactory results that the operation has largely been abandoned by the most progressive obstetricians. The method of dilatation suggested by Harris appears to be an absolutely safe procedure, and a valuable substitute for the original tearing operation.] (See Plates VI. and VII.)

Among the recent [proposed] advances in obstetrics is that of Bernays¹—namely, the successful performance of Cesarean section in placenta prævia. Prior to this case the operation had never been successfully performed under similar circumstances. [His conclusion, however, that it would be advisable to perform a Cesarean section in all cases of placenta prævia in which the Braxton Hicks method or some similar operation is the only alternative is probably too dogmatic and too radical to meet with general favor.]

For the syncope that follows the profuse loss of blood Ethridge² remarks that forcible dilatation of the rectum will most speedily secure the return of the action of the heart. [In what manner he does not state.]

Lemoine³ employs in the acute anemia following grave placenta prævia the following artificial serum: Sodium phosphate and sodium chlorid, of each ʒij; water, Oij; one and a half pints of this may be injected into the buttocks, with prompt disappearance of the symptoms.

Extrauterine Pregnancy.—Numerous cases of extreme interest have been reported during the year. Coe⁴ reports a peculiar case of tubal pregnancy in which there had apparently taken place an external migration of the ovum. At the operation the cavity of the pelvis was found to be closed by adhesions of omentum and bowel. Upon separation of these adhesions, fluid blood and blood-clots were discovered in Douglas's pouch. Behind the right broad ligament—the tumor had been found to be upon the right side—was a mass as large as an orange, resembling a newly-burst sac without a pedicle, which was united to the side of the uterus. Sinking his hand into the pelvis, Coe found a fetus, of about the third or fourth month, actively moving its limbs and surrounded with blood-clots. The sac was evidently that of a recently ruptured extrauterine pregnancy, which, according to the patient's history, was of twelve years' duration. The examination of the tumor was made by Williams of Johns Hopkins Hospital. It was enclosed in the right broad ligament and contained the body of a mummified fetus. The new pregnancy had taken place in the same tube, external to the old tumor; rupture had occurred, with the escape of the fetus into the peritoneal cavity. The left ovary contained a corpus luteum of pregnancy; the right ovary none. The right tube was closed at its uterine end, but free at its fimbriated end. Both Coe and Williams came to the conclusion that the impregnated ovum had wandered over from the left side to the right, and had entered through the fimbriated end of the tube and there developed, as the tube at the position of the old tubal pregnancy was closed.

Sänger⁵ reports a remarkable case of conception taking place through an accessory ostium, the normal ostia of the tubes having been obliterated by changes induced by an ectopic gestation of two years previous. The products of inflammation around the extrauterine sac formed such a firm, resisting

¹ Jour. Am. Med. Assoc., May 12, 1894.

² The Phys. and Surg., Aug., 1894.

³ Rev. Médico-Chirurg. des Mal. des Femmes, Aug. 24, 1894.

⁴ Union Med. Mag., Feb., 1894.

⁵ Lancet, Feb. 16, 1895.

mass, preventing the descent of the head, although the bony pelvis presented normal measurements, that a Cesarean section was required. The right tube ended in a mass of inflammatory products that evidently represented the old fetal sac. The mesosalpinx was buried in membranous bands. The left ovary, however, was found, and close to it lay a large, well-fimbriated accessory ostium.



FIG. 1.—Barbour's case of extrauterine gestation; frozen section of pelvis with extrauterine gestation: U, uterus; D, decidua; G-S, gestation-sac; R, rectum; I, intestines; B, bladder; P, pubes (Edinburgh Med. Jour., Sept., 1894).

Barbour¹ has encountered recently a second case of extrauterine gestation closely simulating retroversion of the gravid uterus, the main symptoms being pelvic pain and difficulty in passing water. Examination showed a tumor of irregular outline extending to the umbilicus, while by the vagina the cervix could not be reached, and the vagina was flattened against the pubes. On operating, the uterus was found displaced to the right of the median line by a swelling behind it containing a decomposing fetus of between the sixth and seventh months. The patient was practically moribund, and died shortly after the operation. Sections of the frozen pelvis were made, the right lateral sagittal, running about three-fourths of an inch from the median line (see Fig. 1), showing best the relations of the sac to the uterus. The gestation-sac was evidently developed in connection with the right Fallopian tube, and was altogether situated posteriorly to the uterus.

¹ Edinburgh Med. Jour., Sept., 1894.

In such cases Barbour emphasizes the importance of hemorrhage from the uterus in determining the diagnosis of the condition. [At the best the diagnosis of extrauterine pregnancy is perplexing, but when complicated by such a combination of circumstances as the foregoing it becomes wellnigh impossible. Fortunately, however, the treatment in either case would be the same—abdominal section, whereby an absolute knowledge of the condition would be gained.]

In view of the extreme rarity, and in some quarters active doubt, of the occurrence of ovarian pregnancy, the following report of Larsen¹ is noticed: A primigravida, aged twenty-three, detected fetal movements at the fifth month. After the normal end of gestation, pain occurred, blood was evacuated by the vagina, and fetal movements ceased, but delivery did not occur. More than a year after the beginning of pregnancy the patient presented herself with a tumor in the abdomen, and complained of pain and a bearing-down sensation. A round, smooth tumor, about the size of the normal uterus, was removed by abdominal section. The tumor consisted of a sac containing a male fetus, macerated and compressed. In the wall of the sac were groups of follicles with evident membrana granulosa, and in some of them ovula were found.

It is unfortunate that lack of space will not permit the presentation in full of three apparently primary cases of abdominal pregnancy that have been reported within the past few months. One of these, that reported by Rector,² was an ectopic pregnancy of twelve months' duration without rupture of the sac. At the time of operation a large ovoid mass presented itself, of a dark-brown color and a semisolid consistence. At the inferior extremity and anteriorly could be seen the slightly enlarged uterus, with the broad ligament, which extended from the fundus of the uterus, and at this point, measuring from three to four inches in diameter, continued to expand until its fibers were entirely lost upon the anterior surface of the tumor. Passing off to the left was the left tube and ovary, while on the right side the perfectly intact tube and ovary were found. There were no adhesions present except at the posteroinferior extremity of the mass, where they seemed to bind down the tumor very firmly into the cavity of the pelvis. The sac contained a full-term female fetus in a stage of progressive maceration. The placenta was situated at the upper posterior corner of the sac. The external covering of the sac was composed of peritoneum, and this was continuous with that of the uterus; its internal covering was mucous, and between the two layers was mainly fibrous tissue with a few scattered muscle-fibers. Inclusion of the left ureter in a ligature resulted in death on the third day after operation. McNutt's case³ resulted in the delivery of a living child at full term. The pregnancy was complicated by uterine fibroid. The placenta was removed and abdominal hysterectomy performed, but death followed within forty-eight hours.

¹ Bibliothek f. Lager, No. 1, 1894.

² New York Med. Jour., Nov. 24, 1894.

³ Jour. Am. Med. Assoc., Aug. 18, 1894.

The child was found loose within the peritoneal cavity, not encased in membranes, and the placenta was attached along the margin of the right broad ligament and to the peritoneum, extending over the ascending colon nearly to the liver. The hemorrhage at the time of placental separation was profuse, and was only arrested by controlling the ovarian circulation.

An interesting case of this sort is added to the records already existing by Werder.¹ On opening the abdomen a yellowish-white cystic tumor was exposed, which on incision revealed a child, which was rapidly delivered by the feet. The cyst was adherent to numerous loops of intestine, and terminated between the folds of the broad ligaments near the uterus. An attempt to extirpate the cyst resulted in severe hemorrhage from a partial separation of the placenta, which was spread out over the spinal column and the right posterior wall of the pelvis. The ovarian artery and branches of the uterine artery were caught by clamps, after which it was comparatively easy to remove the placenta without hemorrhage. The free portion of the cyst was excised, the ovarian and uterine arteries were tied, and the remainder of the sac was drawn together by silk sutures; the cavity of the cyst was packed with iodoform-gauze, and the abdominal wound closed to the gauze. The child was resuscitated, but died on the third day after birth, with rapid breathing and fever. No autopsy was obtained. The mother made a good recovery. Werder has collected and tabulated seventeen cases, including his own.

A case of tuboabdominal pregnancy is reported by Keim.² The patient died without operation, and postmortem examination revealed a large cyst extending from the pubes to about two or three inches above the umbilicus. The cyst was reached without entering the peritoneal cavity. It contained a fetus partially decomposed and weighing six or seven pounds; the placenta was also found within. From the position of the cyst and fetus Keim concludes it must have escaped from the right tube by extraperitoneal rupture, and developed to about eight months of gestation before its death, two months prior to maternal death. On removing the placenta a second cyst was encountered in the region of the bladder, anterior to where the uterus should have been, a little above the pubes and slightly to the left of the median line. This cyst contained a macerated fetus, the result of a tubal pregnancy in the left side which had also ruptured extraperitoneally more than three years before the patient's death.

Among the other interesting cases may be mentioned a coincident intra-uterine and extrauterine fetation reported by Franklin.³ A living full-term fetus was extracted from the uterus by Cesarean section, while in a sac projecting from Douglas's pouch was found a dead full-term fetus. The patient died half an hour after operation. T. Spannochi⁴ reports a case of left tubal pregnancy that ruptured into the abdominal cavity; later the fetus ulcerated its way into the intestines and lodged there, not being expelled

¹ N. Y. Medical Record, 1894, No. 21, vol. xlv.

² Atlanta Med. and Surg. Jour., Sept., 1894.

³ Brit. Med. Jour., No. 1741, p. 1019.

⁴ Raccoglitore Medico, July, 1894.

from the anus until the twenty-eighth day after the accident. The woman made a complete recovery.

As regards the usual direction of rupture of an ectopic pregnancy there seems to be a diversity of opinion. It is generally held that rupture is most prone to occur upward or backward into the peritoneal cavity. Joseph Price, who has operated on over one hundred ruptured tubal pregnancies, has yet to see the first case of rupture into the layers of the broad ligament. Richard Douglas,¹ however, states that primary intraperitoneal ruptures are comparatively infrequent as compared with intraligamentous ruptures, as proved by the reports of cases that abound in literature. [This is evidently a mistake. The testimony of all abdominal surgeons is in favor of intraperitoneal rupture.]

Hart² of Edinburgh contributes a very interesting paper on the extra-peritoneal form of extrauterine gestation. He concludes that the position of the placenta alone determines the nature of the gestation, and he claims that the attachment of the placenta to the free surface of the peritoneum in any case at or beyond the fourth month has never been demonstrated. "Evidence," says he, "is now rapidly accumulating to the effect that extrauterine gestation at or beyond the fourth month is extraperitoneal—*i. e.* while the fetus may be intraperitoneal or extraperitoneal, the placenta is always extraperitoneal." [This may afford a possible explanation of the origin of so-called primary abdominal gestations.] All extraperitoneal gestations begin as tubal pregnancies. As the gestation grows, the folds of the broad ligament are separated to accommodate the developing ovum, and in certain cases the peritoneum remains intact even in advanced gestation, and when rupture takes place the fetus only escapes, as a rule, into the cavity (secondary abdominal gestation). As regards the microscopic anatomy of the placenta he remarks that the supposed necessity for an epithelial covering to the villi, not fetal, but derived from the mother, has led to the supposition that in the so-called abdominal extrauterine gestation the peritoneum formed the maternal part of the placenta, and that, therefore, in abdominal gestation the fertilized ovum passed into the peritoneal cavity and found an admirable serotina in the peritoneum. The comparative anatomy of the placenta has, however, shown that the early fertilized ovum in the hedgehog, rabbit, and other animals absorbs the columnar epithelium of the mucosa, and finds in the connective-tissue elements the necessary basis for its serotina. In a recent research on the structure of the human placenta Hart and Gulland came to the conclusion that the necessary elements for the placenta were, on the one hand, the fetal villi, and, on the other hand, the connective tissue of the serotina; that the covering of the villi was entirely and always fetal; and that the villi at their tips had an active phagocytic action. In the later stages of the extra-peritoneal form of ectopic gestation the placenta develops entirely in relation with connective tissue. The main structure of the extraperitoneal placenta

¹ Internat. Med. Mag., Oct., 1894.

² Am. Jour. Obst., May, 1894.

depends on whether in its growth it is displaced or not. When not displaced its structure, so far as the villi are concerned, is as perfect as that of the normal placenta. Any considerable amount of displacement alters this, however, and causes blood-effusion and organization, so that in extreme cases the placenta may be a mass of blood-crystals, organized connective tissue, and compressed and distorted villi.

Webster¹ remarks that "in the present state of our knowledge a classification of ectopic gestation must necessarily be incomplete. As more exact methods of examination are employed and doubtful ones abolished, it will be more and more perfected and extended." He claims that the following table indicates the range within which our attention should be limited. Beyond this is uncertainty and speculation. It is evident, he says, that the study of ectopic gestation is but the study of pregnancies of tubal origin. [While this is largely true, it is not absolutely so.] His classification is as follows:

ECTOPIC GESTATION.²

Primary tubal in all cases so far as known.

I. AMPULLAR, in which the gestation begins in the ampulla of the tube.

This is by far the most common origin.

1. *Persistent.* In rare instances the tubal gestation may go on to full time.
2. *Rupture may take place early into the broad ligament*—subperitoneo-pelvic, tuboligamentous, extraperitoneal, broad-ligament gestation.
 - (a) The gestation may continue to develop—subperitoneoabdominal.
 - (b) A secondary rupture of subperitoneo-pelvic gestation may take place into the peritoneal cavity.
 - (c) The gestation may come to an end—
 - (a) By the formation of a hematoma.
 - (β) By suppuration.
 - (γ) By mummification, adipoceration, or lithopedion-formation.
3. *Rupture may take place into the peritoneal cavity.*
 - (a) Tuboperitoneal gestation, in which escape of the fetus in the membranes occurs into the peritoneal cavity, the placenta remaining in the tube, its development continuing.
 - (b) The gestation terminates in various ways: By the formation of a hematocele, the patient dying from the shock and loss of blood, or from peritonitis. In some cases absorption of the mass may occur. In others mummification, adipoceration, or lithopedion-formation may take place in the fetus; or suppuration may result.
4. *The gestation may be destroyed*—
 - (a) By the formation of a tubal abortion and its passage through the fimbriated end of the tube into the peritoneal cavity.
 - (b) By the formation of an hematosalpinx.

¹ Am. Jour. Obst., Aug., 1894.

² Cornual pregnancy is not included in this table.

- (c) By the formation of a mole.
- (d) By suppuration resulting in a pyosalpinx.
- (e) By absorption after early death, by mummification, adipoceration, or lithopedion-formation.

II. INTERSTITIAL.—The gestation may develop in the interstitial portion of the tube :

1. The gestation may go on to full time.
2. Rupture of the gestation into the peritoneal cavity may occur.
3. Rupture into the uterine cavity may occur.
4. Rupture into both the uterine and peritoneal cavities may occur.
5. Rupture may occur between the layers of the broad ligament.
6. After the death of the fetus it may remain in the sac, and possibly may undergo the same changes as in the other forms—*e. g.* mummification, adipoceration, or lithopedion-formation.

III. INFUNDIBULAR.—The gestation begins in the outer end of the tube or in an accessory tube-ending. Under this heading are to be included the forms described as tuboovarian and tuboabdominal, names which appear to be unnecessary, since the gestation is a tubal one in origin, the end of the gestation-sac merely becoming adherent to the abdominal wall, the ovary, or other of the viscera.

A new classification of the possible terminations of extrauterine gestation is offered by Dorland,¹ who concludes that there are but three methods by which nature unaided can terminate such a gestation—namely, rupture, death of the product of conception, or continuance of the pregnancy to term. Rupture in the case of tubal pregnancy may be *external*—that is, a combined rupture of the walls of the gestation-sac and the walls of the tube—or *internal*—simple rupture of the gestation-sac without coincident rupture of the tubal walls. External rupture includes: 1. Rupture of the sac-wall with profuse hemorrhage into the abdominal cavity; 2. Rupture of the sac-wall with limited effusion of blood into circumscribed spaces between bands of inflammatory lymph, forming the so-called pelvic and abdominal hematoceles; 3. Rupture of the sac-wall with effusion of blood into the meshes of the broad ligament, constituting a hematoma of the broad ligament. Internal rupture includes: 1. Rupture of a large vessel in the sac-wall with profuse hemorrhage into the gestation-sac itself and death of the embryo, constituting a hematoma of the sac; 2. Tubal abortion, or rupture of the outer or pelvic wall of the gestation-sac without coincident rupture of the tubal wall, with profuse discharge of blood into the abdominal cavity through the fimbriated extremity of the tube; 3. Hematoma of the tube, or rupture of a large vessel with effusion of blood into the sac-walls themselves, without penetration into the abdominal cavity or into the meshes of the broad ligament; 4. Rupture of the inner or uterine sac-wall with discharge of the contents of the gestation-sac into the uterine cavity, whence they are

¹ Am. Therap., Feb., 1895.

expelled as in an ordinary abortion. This can occur only in interstitial or tubouterine pregnancy, and hence may very appropriately be termed interstitial abortion.

In the treatment of ectopic pregnancy Nammack¹ urges immediate abdominal section when rupture has occurred, as more conducive to a low mortality-rate than the expectant plan of treatment. Only in case of collapse would Boldt postpone the immediate operation. Hemorrhage into the meshes of the broad ligament is so rare that this method of rupture cannot be counted upon. In advanced extrauterine gestation Hart² argues that no hard-and-fast rule can be laid down. The treatment must always be operative, but the question arises, how to treat the placenta. If untouched, it may give no trouble (Jessop, Braithwaite), but in most cases it sets up sepsis when left. It may be possible to remove the entire gestation by ligature and partial enucleation (Breisky), or to enucleate the sac, as Olshausen recommends, after preliminary ligature of the ovarian and uterine arteries. Another plan is to separate the placenta, but in many cases the hemorrhage produced by these efforts is so severe as to deter the operator. Hart claims that this can be done with comparative safety when the iodoform-tampon is employed, and that the placenta can be removed on successive days with advantage. In certain cases he would suggest that one should incise the sac abdominally, remove the fetus, plug the sac with iodoform-gauze, and then remove the compressed placenta in about two days. In a case so operated upon by him a piece of the placenta removed at the time of operation was examined microscopically in order to determine its structure. It was found to be perfectly normal, so far as the fetal structures were concerned. The villi were covered by a single layer of well-preserved cubical epithelium; the connective-tissue case of the villi consisted of retiform tissue—connective-tissue corpuscles lying on fine fibrils—and the vessels in the villi were filled with fetal blood-corpuscles. The intervillous spaces were not so near the normal. A certain amount of maternal blood could still be seen in the sections. In addition, however, there were a few delicate threads of fibrin that might have been recently formed, and here and there through the placenta were larger masses of fibrin, some almost as large as a pea. These were evidently the result of an old clotting of the maternal blood; the masses of fibrin sometimes surrounded a villus or two, and had compressed them, and the fibrin was riddled with leukocytes.

Krug³ advises hysterectomy in every case of extrauterine pregnancy in which the nonpregnant appendage is in a diseased condition, thus saving the patient all subsequent trouble. Even if there be a doubt whether a part of the ovary on the other side may be saved, in the presence of such extensive adhesions as will create a large, raw, oozing surface on the posterior wall of the uterus, necessitating free drainage, he claims that it is infinitely better to remove the uterus and secure drainage through the vagina than to leave it

¹ Med. Rec., Nov. 17, 1894.

² Loc. cit.

³ N. Y. Jour. of Gyn. and Obst., June 18, 1894.

Date of operation.	Name of operator.	Age.	Number of pregnancies preceding.	Period of gestation.	Result to child.	Details of operation.	References.
1 Aug. 14, 1876.	Mr. T. R. Jessup, Leeds, Eng-land.	26	1	334 to 34th week.	Living, but died at eleven months from dropsy.	Placenta not removed; no sac, fetus free in abdominal cavity among intestines.	Tait on Diseases of Women and Abdominal Surgery, vol. i, p. 456.
2 July 9, 1881.	Dr. A. Martin, Berlin.	39	2	7 months.	Alive, cord pulsating but did not breathe; had a large encephalocele.	Placenta removed after ligation at three points.	Berlin, klin. Woch., December 26, 1881; Harris, "Extrauterine Pregnancy," Am. Jour. Med. Sci., September, 1888.
3 June 6, 1885.	John Williams, London.	30	1	35th week.	Died in a few minutes.	Placenta not removed, sac drained.	Brit. Med. Jour., December 3, 1887; Harris, ibid.
4 Nov. 4, 1885.	J. Lazarewitch, Kharkof, Russia.	27	1	9 months.	Lived 36 days.	Placenta and cyst drawn out, pressed up in the abdominal wound, ligated, and large portion removed.	Vrach. St. Petersburg, 1886; Harris, ibid.
5 May 29, 1887.	Heeter Treub, Leyden.	34	1	2 to 3 weeks before end of term.	Living, weight over 4 pounds. A year later a strong, healthy boy.	After incision of the sac, which bled freely, placenta was perforated with hand, and after extracting child bleeding was controlled by compressing each half of placenta by the hand of operator and assistant until removed; portion of sac extirpated, the rest intimately adherent to intestines, sewed to abdominal wound, and packed with Mikulicz dressing. Supposed to have been an ovarian pregnancy or a pregnancy in a tuboovarian cyst.	Zeitschrift für Geburtsh. und Gynäk., Band xv, S. 384, 1886.
6 Oct. 29, 1887.	Aug. Breisky, Vienna.	39	...	End of 8th month.	Alive and well, weight 5 pounds, but died 3 weeks later from phlebitis of umbilical vein.	Tubal intrafallopian pregnancy. After removing child from the sac, the latter was drawn out, ligated at its junction with the uterus, and removed, containing placenta and membranes, and cavity drained. Mother recovered perfectly in three weeks.	Wiener, med. Wochenschrift, 1887, Nos. 48, 49, 50, 51, 52, 53, 54, 55, 56; and Eastman, in Am. Jour. Obstet., vol. xxi, 1888.
7 July 10, 1888.	Joseph Eastman, Indianapolis.	39	1	7 months.	Living, weight 4 pounds. Died at eight months from pneumonia.	Intrafallopian tubal pregnancy. Clamped uterine end of tube, and broad ligament, and amniotized fetal sac containing placenta intact, and quilted the pedicle with cobblers's slitch, using iron-dyed silk.	Am. Jour. Obstet., 1888, p. 929.
8 Nov. 1, 1888.	R. Oldhausen, Berlin.	30	1	9 months.	Living, weight 5 pounds. When a year old, weight 14 pounds.	Fetus free in abdominal cavity; also largest part of placenta, between loops of intestines; the latter adherent to right broad ligament with only about one-third of its periphery. This last portion was easily surrounded, and proved so thin that two mass ligatures of silk were sufficient to securely tie off the placenta with attached portion of broad ligament. Only shreds of fetal membranes were attached to placenta.	Deutsche med. Wochenschrift, 1890, p. 171.
9 Feb. 11, 1889.	Carl Braun von Fernwald, Vienna.	...	2	End of term.	Living, weight over 6 pounds. Died seventy-two hours after birth from lobular pneumonia. The lungs were saturated of amniotic fluid.	Child free in abdominal cavity; placenta adherent to posterior surface of uterus and right broad ligament, extends deep into Douglas's cul-de-sac, and firmly attached to descending colon. After ligating right broad ligament in middle of its extent, and the posterior surface of uterus, the placenta was removed, without hemorrhage. Removal of sac necessitated elastic ligature around uterus to check bleeding, and supravaginal hysterectomy.	Archiv f. Gynäk., Heft ii., 1890.

19	Feb. 27, 1889.	R. Olshausen, Berlin.	32	4	9 months.	Alive, but very much de- formed. Died one and half hours after birth.	Sac and placenta left undisturbed and drained with iodoform- gauze packing. Spontaneous expulsion of placenta on thirty- fourth day. Interesting is the daily copious discharge of fluid from the vagina during the eighth month, which was undoubt- edly amniotic fluid draining away through tube. No amniotic fluid present during operation.	Deutsche, med. Woch., 1890, p. 171.
11	Feb. 4, 1890.	G. Rehn, Kiew, Russia.	35	37th week.	Living, weight 6 pounds; slight asymmetry of head. Two years after operation was healthy and well.		Infraligamentous tubal pregnancy. Sac, placenta, and fetal membrane removed entirely by enucleation from the peritoneum, in the same manner as practised in removal of intraligament- ous ovarian cyst.	Centralblatt f. Gynäk., No. 46, 1892.
12	1891.	John W. Taylor, Birmingham, Eng.		9 months.	Living.		Fetus free in abdominal cavity; placenta left behind and drain- age tube in abdominal wall. The lower angle of the wound, patient recovered after very good convalescence, complicated by sepsis, thrombosis of left iliac, the inferior vena, the right iliac, and right renal veins.	Obstet. Trans. of London Soc., 1891, p. 115; and Lusk, in New York Jour. of Gynecol. and Obstet., July, 1893.
13	Jan. 10, 1891.	Prof. Schauta, Vienna.		7 months.	Living.		After tying ovarian artery at the peritoneal fold, which con- stituted the residue of the infundibulopelvic ligament, he in- closed the peritoneal covering in a circular line corresponding nearly to the largest circumference of the sac. The enuclea- tion of the latter was readily accomplished without rupture of sac-walls. Considerable hemorrhage resulted from detach- ment of the ovum from the uterus, which was temporarily controlled by pressure and later by sutures. The peritoneal cavity was closed and returned to its normal position. The ovum, and the ovary itself was drained by Mikulicz tampon.	Beiträge f. Gynäk. u. Pro- gnose und Therapie der Extramütter. Schwän- gerschaft, Prag, 1891; and Lusk, in New York Jour. of Gynecol. and Obstet., July, 1893.
14	Oct. 23, 1892.	Dr. Mordcaui Price, Phila- delphia.			Living.		Placenta attached to uterine attachment of left tube and the fetal membrane. The sac was opened, the placenta and ex- tending up to the kidney posteriorly and covering the bladder and colon. It was slightly wounded in the abdominal incision and the cause of considerable hemorrhage; this was controlled by clamping-forceps, which were allowed to remain until first dressing. The child was enveloped only by amniotic sac, to which were attached the transverse colon and also small in- testines to a slight extent. Placenta left and sac packed with iodoform-gauze. Last portion of placenta removed on thirty- fifth day.	Transactions of the State Medical Society of Penn- sylvania, 1893, p. 152.
15	Aug. 19, 1893.	Wm. T. Lusk, New York.	33	1	6 months.	Lived twenty-four hours.	Pregnancy started in right tube, and subsequently developed to a great extent between the folds of broad ligaments. Tied ovarian and uterine arteries of right side, and then enu- cleated entire sac with placenta.	Lusk, "Technique of Pri- mary Calectomy in Ad- vanced Cases of Extra- uterine Pregnancy," in N. Y. Jour. of Gynecol. and Obstet., July, 1893.
16	1894.	Hector Troub, Leyden.		3 weeks be- fore term.	Lived several weeks.		Fetus free in abdominal cavity. Supravaginal amputation of uterus; removal of placenta and sac. (Private communication from R. P. Harris.)	Bulletin Mem. Soc. Obstet. et. Gynecol. de Paris, 1894.
17	April 4, 1894.	X. O. Werder, Pittsburgh.		2 weeks be- fore term.	Lived four days.		Child enveloped in amniotic sac and also partly by folds of broad ligaments. Placenta removed after clamping and subsequently tying ovarian and uterine arteries of left side. Part of sac incised, but portion had to be left on account of firm intes- tinal adhesion. Edges of sac and stump of left broad ligament drawn together by sutures and attached to parietal peritoneum, and drained by Mikulicz gauze packing.	Med. Rec., Nov. 24, 1894.

and drain through the abdomen. [This advice, we think, is too radical, at least in the present state of our knowledge of the proper management of tubal pregnancy. It is not difficult to conceive of many cases in which, even though the other appendage appear diseased, a subsequent normal gestation is possible. It is true that a woman who has suffered from tubal pregnancy on one side is very likely to develop the same condition on the other side, but this is by no means invariably the case.]

Werder¹ has investigated the question of the ultimate fate of the ectopic children that were delivered alive. He has been able to obtain the record of 40 cases. Of these, 18 died within a week after birth; 5 within a month; 1 died at six months, of bronchopneumonia; 1 at seven months, of diarrhea; 2 at eleven months, 1 from croup; 1 at eighteen months, from cholera infantum—making a total of 26 deaths, and leaving 14 children to be accounted for. Of these, 5 were reported as living and well after operation, with no subsequent report; 1 was strong and healthy after three weeks, but there has been no report since; 1 was well at six months, then was lost sight of; 1 was well at last report; 2 live and are well at one year; 2 are living and well at two years; 1 (Beisone's case) is well at seven years; and 1 (Tait's case) is well at fourteen and a half years. The preceding list (see pages 372, 373) contains all the successful cases of abdominal section for advanced ectopic gestation with living children that have been reported up to date, with such important data as may prove of interest in connection with the cases.

ABORTION.

Its Prophylaxis.—Kortright² urges the importance of giving greater attention to the prophylactic treatment of abortion than is generally advised in books on obstetrics. The deleterious effect of abortions upon the subsequent general health of the patient is too frequently overlooked. Out of 100 women that miscarry (and this does not mean out of 100 miscarriages), 22 will remain sterile; of these, 14 will have painful and incurable pelvic disease, and 8 will not suffer, but will be barren. These are the figures of Napier of London. When repeated abortions occur soon after marriage they indicate lack of development of the sexual organs; when occurring late in life they indicate exhaustion of the power of reproduction. Single abortions occur either soon after marriage or during the course of childbearing; they indicate disease of the reproductive organs.

Abortions of paternal origin are due either to syphilis or to too much sexual indulgence. Abortions of fetal origin result from dropsy of the chorion; hypertrophy and villous degeneration of the chorion; fibrolipomatous degeneration of the placenta; hemorrhage into the placenta from large branches of the umbilical vein; stenosis of the umbilical vessels; calcareous and syphilitic degeneration of the placenta; and hydrocephalus. Abortions of maternal origin are either traumatic or pathologic. Endometritis is the most common pathologic condition, and in order to prevent subsequent

¹ Med. Rec., Nov. 24, 1894.

² Brooklyn Med. Jour., Sept., 1894.

abortions it becomes essential that this condition be effectively treated. Uterine displacements should be corrected. Any elevation of temperature occurring during gestation must be vigorously combated, for fever is especially inimical to fetal life. In all suspected specific cases a constitutional course of mercurial treatment must be instituted, associated with tonics, such as iron and potassium chlorate. [Too much emphasis cannot be laid upon the prophylaxis of abortion. This, unfortunately, seems to be one of those subjects in medicine which it is nobody's duty to oversee. By an appropriate course of gynecologic treatment during the intervals preceding gestation not only could many fetal lives be preserved, but an incalculable amount of maternal suffering could be prevented.]

The Influence of Drugs upon Pregnancy.—The deleterious effects of certain drugs upon pregnant women has repeatedly been noted. In the February (1894) number of the Indian Medico-Chirurgical Review the results of a collective investigation of the effects of quinin on pregnancy were published. The conclusions reached were as follows: 1. The existence of pregnancy is no bar to the administration of quinin; 2. In fevers and other affections during pregnancy in which quinin is indicated the effects of the drug are more marked than those of any other; 3. That abortion following the administration of quinin is either the result of the original malady or the effect of idiosyncrasy; 4. That, allowing for an idiosyncrasy in cases in which a tendency to abortion exists, and in others as a matter of precaution, quinin is best administered combined with a sedative (opium); 5. Hence the old-standing view of the action of quinin on the duration of pregnancy is not borne out by the clinical experience of many obstetricians. [The repeated failure in the hands of others of large doses of quinin to institute labor-pains at term is conclusive proof of the accuracy of these statements.]

Vineberg¹ claims that salicylic acid and its compounds should not be administered to pregnant women who show a predisposition to abort. The administration should be watched carefully in all cases of pregnancy, and on the appearance of any "show" or anything resembling labor-pains they should be discontinued. Bossi² finds that sugar possesses the power of stimulating uterine contractions. If administered in one-ounce doses, dissolved in water, during the progress of labor, its effect on the pains is usually manifest in from twenty-five to forty-five minutes. The contractions induced by the ingestion of the sugar are of the normal character. Ungar³ regards *secale cornutum* as an abortifacient, although not acting in every case in which it is administered.

Surgical Operations and Pregnancy.—Staveley⁴ states that myoma complicating pregnancy is rather uncommon, on account of the tendency of this growth to cause sterility, or, in the event of pregnancy, to induce early abortion. Virchow and Seanzoni state that fully 50 per cent. of women having myomata are sterile. The dangers of surgical operation upon these growths

¹ N. Y. Med. Jour., June 23, 1894.

² Brooklyn Med. Jour., Sept., 1894.

³ Deutsch. med. Woch., No. 46, 1892.

⁴ Johns Hopkins Hosp. Bull., No. 38, 1894.

during pregnancy are shock, abortion, hemorrhage, intestinal obstruction, and infection. On the contrary, in noninterference, abortion, hemorrhage, sepsis, rupture of the uterus, pressure-symptoms, intestinal obstruction, and mechanical obstruction to labor may occur. The author tabulates 33 cases, including 2 previously unpublished operated upon by Kelly of Baltimore. The maternal mortality was 8, or 24.25 per cent.; 2 deaths were due to hemorrhage, 1 to long-standing aortic disease, and 1 to peritonitis; 3 died after abortion and 1 sank from some unspecified cause; 24, or nearly 80 per cent. of the 33, have been reported since 1884. Eliminating cases operated upon before 1885, there remains a mortality of 16.66 per cent. Since 1889, 17 cases have been reported, or over half the entire number, with a death-rate of 11.75 per cent. The fetal mortality is 30.30 per cent., or 9 abortions and 1 miscarriage; 20 of the women were delivered at term of living children; 1 was prematurely delivered at the eighth month, nearly six months after the operation. In 3 cases in which the mothers died no statement is made concerning abortion. Sixteen myomata are reported as pedunculated; 4 of the patients (including the case of aortic disease) died after operation, 1 aborted, 1 died after giving birth to a stillborn child. In 15 cases in which the myoma was sessile there were 6 abortions and 4 patients died. Nine were operated upon during the last eight years, with 2 deaths and 1 abortion; the abortion occurred in one of the fatal cases. Staveley considers that, with our present experience and with the improvements that have acted so beneficially on modern surgery, myomectomy for pedunculated or sessile tumors during pregnancy is, in properly selected cases, comparatively safe and thoroughly justifiable.

Everke¹ has twice enucleated myomata from pregnant women. The first patient was in the fourth month of pregnancy, the tumor the size of two fists; abortion occurred two hours after the operation. The second patient was three months pregnant, the tumor the size of a child's head. The patient recovered without fever, but four weeks later aborted during an attack of gastroenteritis with high temperature. In both cases the sac left after enucleation was sewn to the abdominal walls.

Gordon² reports five successful cases of ovariectomy during pregnancy from Lebedeff's clinic, three of the patients aborting (one on the fifth and two on the fifteenth day after operation), while in the other two pregnancy was not interrupted. He collected 204 cases, in 21 of which it was not stated whether the pregnancy was interrupted or not. In 7 the uterus was injured, 2 patients succumbing. Of the others, 93.2 per cent. recovered and 6.8 per cent. died; 22 per cent. aborted, while in 69.4 per cent. delivery occurred at full term. The total mortality was only 3 per cent., while in 78 per cent. of all the cases the pregnancy was not interrupted.

Everke³ has operated on two cases of ovarian cyst complicating pregnancy. The first patient was two months pregnant; gestation continued to

¹ *Centralbl. f. Gynäk.*, No. 24, 1894.

² *Ibid.*, No. 23, 1894.

³ *Loc. cit.*

term. The second patient, five months pregnant, was spontaneously delivered eight hours after the operation; she finally recovered. In two successful cases ovariectomy was undertaken after delivery. On one occasion Everke observed spontaneous reposition of a large ovarian tumor during labor. May¹ operated on a woman eight months pregnant with a large ovarian cyst complicating. As soon as the patient recovered from the anesthetic labor began, and twelve hours later the woman was delivered of a stillborn child. Her subsequent recovery was uninterrupted. In one case Everke² excised from the cervix a carcinomatous growth the size of a crown-piece at the fourth month of pregnancy, without abortion ensuing. [The occurrence of labor-pains after such operations as the foregoing depends largely upon the degree of nervous irritability of the patients. When they do follow there probably exists the so-called irritable uterus of pregnancy.]

Löhlein³ reports two cases of normal labor in women upon whom the operation of suspensio uteri had previously been performed, and Fraipont⁴ four cases. Löhlein concludes that suspensio uteri does not interfere with the occurrence and progress of pregnancy. It would seem that during the gradual growth of the uterus the fixation-bands also enlarge, and subsequently decrease with it in its restoration, without losing their usefulness as supports to the uterus.

The Acute Infective Diseases and Abortion.—This subject has been studied by Voight⁵ and Klautsch.⁶ The latter asserts that in these cases pregnancy may be terminated either by the death of the fetus or, as less frequently happens, by premature contractions. The fetus may die from (*a*) deficiency of oxygen; (*b*) alteration in temperature; or (*c*) direct transmission of the infection. These conditions may be combined. The inconstancy of the transmission of the infection Klautsch explains by the circumstance that it can occur only when the normal connection between the maternal and fetal circulation is disturbed. Premature pains may be caused by (*a*) increased bodily temperature; (*b*) altered blood; (*c*) changes in the uterine mucosa, as an endometritis exanthematica; or (*d*) toxins present in the blood. If the deficiency in oxygen occurs rapidly, the fetus dies; if more gradually, pains are induced. In typhoid fever abortion occurs in more than half the cases, and the fetus is usually born dead, generally from the transmitted infection. Cholera is not transmitted to the fetus, the death being here due to the altered blood, to an endometritis, to a diseased fetal placenta, and to temperature-variations. In measles the fetus rarely dies. In severe malaria the fetus is more often born alive, but soon dies of malarial cachexia. In pneumonia the death of the fetus is not uncommon, and is due to asphyxia. Variola frequently kills the fetus, yet many are

¹ Brit. Med. Jour., Dec. 2, 1893.

² Loc. cit.

³ Deutsch. med. Woch., No. 11, 1894.

⁴ Ann. de la Soc. Médico-Chirurg. de Liège, 1894.

⁵ Samml. klinisch. Vorträge, No. 112, 4th series, Nov., 1894.

⁶ Münch. med. Woch., Dec. 26, 1894.

born alive. As regards the pains, the fetus may be expelled in variola, even during the suppurative stage; in malaria after the paroxysm; in erysipelas most often when the eruption appears; in cholera during the transition-stage; in influenza soon after the onset of the febrile symptoms; in pneumonia on the third or fourth day. In typhoid fever the abortion may be accompanied by much hemorrhage or by strong contractions and little hemorrhage. In cholera the hemorrhage is profuse and the contractions are violent. The fetus is mostly threatened much more by the altered temperature, disturbed circulation, and pathologic changes in the endometrium than by the transmission of the infection.

Treatment of Inevitable Abortion.—[As might be expected, there has appeared a vast amount of literature devoted to the proper management of this common obstetric condition, little of which, however, is possessed of marked inherent value.] Ranson¹ makes a plea for the use of the intra-uterine tampon in securing an early and complete expulsion of the secundines. He [rightly] claims that by the employment of a carefully applied strip of iodoform-gauze packed into the cervical canal and lower uterine segment not only are vigorous uterine contractions induced, but all danger from sepsis and hemorrhage is minimized. Eckstein² would limit the tampon to those cases only in which there is no dilatation of the os uteri. Jepson³ insists upon the preservation intact of the descending ovum, claiming that as long as the membranes remain unbroken the contractions are more effective and the danger of sepsis from retention of portions of the ovum is lessened. Ill⁴ goes further, and says that when the ovum has been broken or a finger once introduced into the uterine cavity, an instrumental delivery with curettage of the endometrium becomes a necessity. Eckstein⁵ believes that a thorough curettage should follow every emptying of the uterus in abortion. In his opinion the instrumental method of the treatment of abortion is the only rational one, and ergot and similar drugs should be used only when the uterus is empty. [The employment of the curet in the treatment of inevitable abortion is required in every case in which there is known to be a retention of a portion of the ovum, and even its routine employment could not be followed by ill results.] In old and neglected cases of abortion Mundé and Dudley⁶ secure dilatation of the os uteri by means of tents, the former by the tupelo tent, and the latter by the laminaria tent. Dudley remarks that the laminaria tent has iodine in its composition, and is, therefore, in itself antiseptic. He always dips it into pure phenol, then into vaselin, and inserts it into the cervix. He has never seen sepsis follow the use of this tent. [The use of tents is fortunately becoming obsolescent, and their employment cannot be recommended in any case. Thorough asepsis is utterly impossible even when the most energetic precautions are observed.]

¹ Jour. Am. Med. Assoc., Oct. 20, 1894.

² Prager medicin. Woch., Nos. 17 and 18, 1892.

³ Jour. Am. Med. Assoc., Nov. 3, 1894.

⁵ Loc. cit.

⁴ Med. Record, Oct. 6, 1894.

⁶ Am. Medico-Surg. Bull., May 15, 1894.

LABOR.

The Contraction-ring.—From a study of the lower uterine segment in the bodies of two pregnant women, and of six who died in the puerperal state, Regnoli¹ finds that the vena coronaria may always be recognized at the end of pregnancy and in the beginning of the puerperium: it is placed sometimes higher and sometimes deeper than the contraction-ring, and indicates the upper boundary of the lower uterine segment. The contraction-ring does not always correspond to the attachment of the abdominal tissue. It is shown by a thickening and shortening of the muscle-fibers at that position in which the lower uterine segment begins to become thinner, and is marked on the outer as well as on the inner wall. The outer wall is always thinner than the inner.

Pain.—Dewees,² in considering painless childbirth, which, he claims, is the normal condition, says that the pain of labor arises mainly from cervical rigidity. To obviate this he would employ during the first stage of labor hot water, morphin, and atropin; during the second stage, hot water and chloroform or bloodletting; and during the third stage, good nursing. As regards the use of chloroform in labor, Bedford Brown³ says that in all literature there are reported not more than forty cases of death from the employment of the anesthetic during parturition. In 2000 cases of labor that he has attended he has given chloroform in 1500 without ill effects following. The chloroform is required only as the pain is coming on, and should be stopped as it passes away. In this manner only a small amount will be given and yet much of the suffering alleviated. [Happily, the day is now passed in which the patient is permitted to suffer unnecessarily during labor. A few whiffs of the anesthetic during the height of the severe pains toward the close of the second stage are not productive of evil, and materially lessen the woman's suffering.]

Examinations.—Leopold and Spörlin⁴ urge the importance of conducting labor by means of external examination solely. They claim that by this means the mortality may be still further reduced. Leopold reports 1000 labors so conducted, in 935 of which a correct diagnosis of position and presentation was made. The methods employed and advocated are divided into four distinct manipulations: 1. Both hands, slightly flexed, are placed upon the abdomen and gradually carried upward toward the fundus. This shows the size of the uterus, time of gestation, whether the child is in longitudinal or transverse position, and whether the head or the breech occupies the fundus (Fig. 2). 2. The hands are placed upon each side of the uterus; then under one hand is felt the arched back, under the other the small parts corresponding in position to the abdominal surface of the fetus (Fig. 3). 3. The fingers of the right or left hand are spread as much as possible, and the presenting part is seized between the thumb and middle finger. If it is round

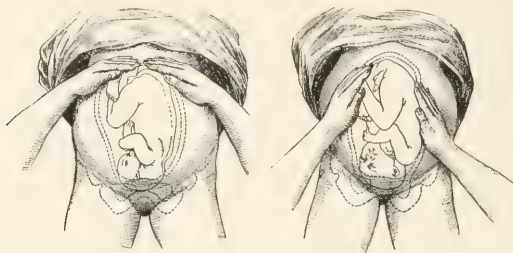
¹ Centralbl. f. Gynäk., No. 49, 1894.

² Internat. Med. Mag., Dec., 1894.

³ Med. News, May 18, 1895.

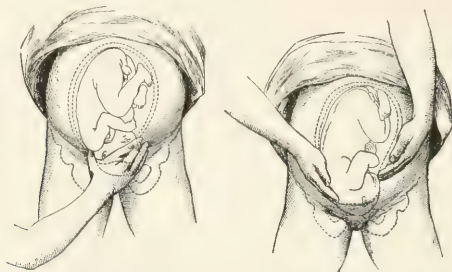
⁴ Archiv f. Gynäk., Band xlv. Heft 2.

and hard, it can only be the head, which can be grasped like a cannon-ball and, if above the pelvic brim, moved. The breech is softer and its surface more irregular. If the outlines of the presenting part are indistinct, pla-



FIGS. 2, 3.—Leopold and Spörlin's methods of abdominal palpation (*Archiv f. Gynäk.*, Band xlv. Heft 2).

centa prævia may be suspected. If no presenting part be felt, then the head must be looked for on either side. This third method is very valuable in all cases in which the presenting part is yet in the entrance of the pelvis (Fig. 4).



FIGS. 4, 5.—Leopold and Spörlin's methods of abdominal palpation (*Archiv f. Gynäk.*, Band xlv. Heft 2).

4. The physician takes his place at the side of the bed, turning his back toward the woman's face. The hands are placed in such a manner upon the abdomen that the fingers are directed toward the cervix. During the intervals of pain the hands are pressed down deep into the pelvis and the presenting part is grasped. The head is again recognized by its peculiarities (Fig. 5). [While much may be learned by this method of examination, in the hands of beginners the vaginal examination is absolutely necessary.]

Age.—Munder¹ records his investigations, conducted in the Frauenklinik at Bern from 1872 to 1891, upon the proportion of births occurring in the earlier years of life, and the results of his studies: 493 cases were

¹ *Am. Jour. Med. Sci.*, May, 1894.

chosen, the limit of age being twenty years. His conclusions are as follows: 1. Menstruation occurred in most cases at a somewhat earlier age than that commonly reported. 2. The greater proportion of births have a favorable ending. 3. Generally-contracted pelves are more frequent in the earlier years, and frequently the bony pelvis is fully developed about the twentieth year. 4. Vertex and face presentations are more frequent, and pelvic presentations more rarely seen, than in general. 5. The average duration of the period of birth is from two to three hours longer in primiparæ, and decreases gradually toward the twentieth year. 6. Eclampsia, weak pains, and other complications are not more frequent in primiparæ, and the forceps is not more frequently needed; on the other hand, however, perforation was necessary more often, on account of the greater frequency of generally-contracted pelves. 7. Lacerations of the perineum are more rare in young primiparæ because of episiotomy, the gradual advancement of the birth, and the greater elasticity of the soft parts of the birth-canal. This is plain when contrasted with the condition in old primiparæ. Episiotomy is necessary [in our opinion never] generally in very young primiparæ with narrow rima. 8. The number of female births was found to be relatively greater than that of males. 9. The younger the mother, on the average, the smaller the child. 10. Premature births occurred most frequently when the mother was young. 11 and 12. The proportion of living children was favorable, and the course of the puerperal period good, when the mother was very young.

Bidder¹ destroys the old theory that old primiparæ run great risks, which he regards as a mere piece of apriori reasoning. The duration of labor is distinctly longer, but only in the first stage; operative interference, especially with forceps, is frequently needed. Kidney-complications and eclampsia are relatively frequent, but abnormal presentations, ruptured perineum, and severe puerperal diseases are not more common than in younger women.

Position.—Walcher's position, the woman in the dorsal posture with the hips at the edge of the table and the lower extremities hanging,² is growing in favor among obstetricians. It is especially valuable in artificial delivery in narrow pelves, both the diagonal and true conjugate diameters being lengthened by this posture. Walcher found a gain of from 8 to 13 mm. in the true conjugate on changing from the lithotomy position to the Walcher position. Jewett³ claims that this posture should be adopted in all cases in which any difficulty in labor is experienced. Küster⁴ has found this position most advantageous in the treatment of moderate degrees of pelvic contraction.

Ecbolics.—Marx⁵ restricts the use of quinin in labor to the first stage only, and then only in the case of secondary weak pains—that is, in uterine inertia occurring after exhaustion of the uterine muscle has occurred, the

¹ Berichte aus der Universitäts Frauenklinik zu Dorpat, 1894.

² Jewett, Brooklyn Med. Jour., Nov., 1894.

³ Loc. cit.

⁴ Centralbl. f. Gynäk., No. 10, 1895.

⁵ Am. Med.-Surg. Bull., May 1, 1894.

primary pains being full and vigorous. He preferably administers the drug per rectum, to avoid vomiting. The *modus operandi* of quinin in labor is an unsettled question, although it is probably nonecbotic, but effects its object by virtue of its powerful stimulant and tonic influences on the brain and nerves.

Preservation of the Perineum.—McCartie¹ insists that laceration of the perineum results from extension of the head, and proposes the following method of maintaining complete flexion of the head: The patient lying upon the left side, as soon as the occipital region is born it is grasped by the right hand, with the fingers near the mons veneris and the thumb behind on some portion of the parietal bone. In this way the uterine force can be easily counteracted and the extreme efforts of the patient readily controlled, because, the head being thoroughly flexed, the force is controlled in the direct axis of the uterus; but, more important than this, the elasticity of the perineum is counteracted, and extension or rotation over its floor is prevented. The two forces, uterine and perineal, are directed more into a downward movement of flexion, and not into a forward one of extension. The smallest diameter—the suboccipitobregmatic ($3\frac{3}{4}$ inches)—is thus the first part to meet the vulvar outlet, and it acts as a dilating plug, thereby lessening the danger of rupture of the perineum. Brown² remarks that in many cases perineal laceration results from the large size of the fetal abdomen, and not from the passage of the head or shoulders. Delay at this period of labor will favor uterine relaxation, whereby much of the blood in the fetal abdomen will be carried back toward the secundines, and the size of the abdomen will be materially decreased.

The Height of the Fundus Uteri during the First and Second Stages of Labor.—Fothergill³ finds by actual measurement that during labor the uterus is narrowed both laterally and anteroposteriorly, though it is not reduced in length. Its cubic contents, however, are considerably lessened, as it loses its rotundity and becomes a mere elongated cylindric body. This loss of cubic contents is accounted for by passage of part of the child from the uterus into the vagina, and by loss of the liquor amnii. [This is a verification of the assertion that the uterine force in labor is exerted through a diminution of the extrauterine space, and not through direct pressure upon the fetus.]

Delivery-pan.—Simpson⁴ calls attention to a delivery-pan still in use in Spain, no description of which has as yet been published. The vessel is made of strong, glazed earthenware, and resembles the pan of a close-stool, except for the excavation on one side through which the hand of the attendant gets access to the patient's pudenda, and through which the child can be guided forward. It is $11\frac{1}{2}$ inches in depth in the interior, and $6\frac{7}{8}$ inches in width at the bottom. At the brim it measures 10 inches in diameter, extending to $15\frac{1}{4}$ inches at the outer margin of the flange, on

¹ N. Y. Med. Jour., May 25, 1895.

² Therap. Gaz., June 15, 1895.

³ Edinburgh Med. Jour., June, 1895.

⁴ Ibid., March, 1895.

which the patient sits and which is $2\frac{3}{4}$ inches broad. The aperture in the side extends for a depth of 6 inches from the inner edge of the flange,



FIG. 6.—Spanish delivery-pan (Edinburgh Med. Jour., March, 1895).

and at its upper end is $5\frac{1}{4}$ inches wide at the inner margin of the flange (Fig. 6).

The Use of the Catheter after Labor.—Recht¹ shows that on the evidence of repeated observations micturition after labor is almost always spontaneous. In 6666 labors under Pinard's care in the course of the last four years the catheter has been used only 20 times, and in the 1920 labors last year only 3 times. Pinard objects very strongly to a routine use of the catheter, which even in skilled hands often sets up cystitis. The practice in Paris lying-in hospitals is, however, very varied. At the school of midwives nearly every newly-delivered patient has the catheter passed. Maygrier, at the Pitié, delays the use of that instrument until twelve hours have elapsed after labor without the patient being able to pass water voluntarily. Bar allows a maximum of eighteen hours; Porak and Budin, twenty-four; Tarnier, thirty-six; Champetier de Ribes, forty-eight. Ribemont-Dessaignes, at the Hôpital Beaujon, objects to the catheter as strongly as Pinard. Bois-sard finds that not only is there danger of cystitis when the catheter is passed after labor, but the patient is liable to lose the power of voluntary micturition for many days through nervousness. [The use of the catheter after labor too often partakes of the nature of meddling obstetrics. From twelve to eighteen hours at least should elapse before any artificial means of emptying the bladder should be resorted to. A delay longer than this, however, is very likely to result in more or less vesical irritation that might otherwise be avoided.]

Temperature.—Giles² gives an analysis of 600 cases of normal labor from the point of view of the relation of the temperature immediately after delivery to the characters of the labor. The results are summarized as follows: 1. The average rise of temperature due to labor is slight, in the 600

¹ Jour. de Méd. et de Chirurg. pratiqu., May 25, 1894.

² Canad. Pract., Nov. 1, 1894.

cases the average temperature being 98.7° F. 2. The length of the labor bears but a slight relation to the subsequent temperature. 3. The length of the second stage, however, has a direct influence on the temperature, which rises in proportion to the length. 4. The time of day at which delivery takes place has very little influence on the temperature, which, however, is highest in the groups of cases in which delivery takes place between 12 P. M. and 4 A. M., and between 4 P. M. and 8 P. M. 5. When chloroform is given during the second stage of labor the temperature is commonly lower immediately after delivery, even if the second stage is prolonged. The average temperature in 15 cases with a second stage averaging two hours and forty minutes is 98.7° . 6. A similar result follows the application of forceps under chloroform; in 26 cases with a second stage lasting on an average three and a half hours the average temperature was 98.8° F. 7. In 12 cases of natural delivery in which the second stage lasted on an average thirty-five minutes, but where an intrauterine douche was given, the average temperature afterward was 99.4° F.

MATERNAL DYSTOCIA.

Contracted Pelvis.—The question of the development of the pelvis has commanded the attention of able men on both sides of the water. In the Geburtshülfflich-Gynäkologischen Klinik at Bern, Konikow¹ has made the development of the pelvis of both sexes the subject of an exhaustive series of measurements extending from birth to the twentieth year. He concludes that every period of life has its peculiar and appropriate force that affects the development of the pelvis, and that the forces vary in grade and strength in each period of life so as to be easily recognized. During the first period, in which he classes children of both sexes from birth to the end of the fifth year, the greatest influence is the internal energy of joint-growth, and no pressure is exercised upon the sacrum. From the second to the fifth year this pressure of the body-weight on the sacrum first appears, but until the tenth year it remains influenced by external conditions. From the tenth to the eleventh year the pelves of both sexes exist under the same influences, and in the sexual sense there is little difference between them. For the first time, during the tenth or eleventh year the female pelvis begins to prepare for its future task, and is gradually made greater than the male in all its dimensions. At the time of the beginning of ovulation and menstruation it can be easily distinguished from the male. At the nineteenth or twentieth year the male pelvis is equal to or greater than the female in the transverse diameter, but the latter has much the greater measurement in the diagonal conjugate.

Hirst² directs attention to the influence of the habitual inclination of the pelvis in the erect posture upon the shape and size of the pelvic canal. He remarks that "if there is an exaggerated inclination of the pelvis in childhood, as in rachitis, dislocation of the femora, double club-

¹ Archiv f. Gynäk., Band xliv. Heft 1.

² Univ. Med. Mag., Nov., 1894.



FIG. 1.

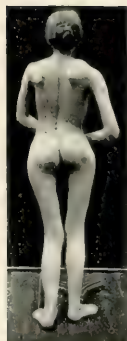


FIG. 2.



FIG. 3.



FIG. 4.



FIG. 5.



FIG. 6.



FIG. 7.

Maternal dystocia.

FIGS. 1, 2, 3, and 4 represent a young woman, aged nineteen, with extreme lordosis following paralysis of the spinal extensor muscles.

FIGS. 5, 6, and 7, an Italian woman, aged twenty-five, with pelvic deformity resulting from osteomalacia (Univ. Med. Mag., Nov., 1894).

foot, lordosis, etc., the direction in which the trunk-weight is received by the sacrum increases the rotation forward of that bone upon its transverse axis, diminishing the anteroposterior diameter of the inlet and diminishing the depth of the pelvic canal. Further, the exaggerated pull of the rotative muscles of the thigh, put constantly upon the stretch, separates the tuberosities of the ischia more widely than common, and thus widens the pelvic outlet. On the other hand, if the pelvic inclination is much diminished, as in kyphosis from caries of the spine, rachitis, or certain forms of osteomalacia, the top of the sacrum is pushed backward, so that this bone is lengthened and straightened, thus making the anteroposterior diameter of the inlet greater and increasing the depth of the pelvic canal. Further, the pull of the iliopsoas muscles, put upon the stretch in the erect posture, drags the iliac bones apart, and by a compensatory movement approximates the ischia, thus diminishing the transverse diameter of the pelvic outlet." Some of the most important pelvic contractions may thus result from the habitual inclination of the pelvis in the erect posture. Hirst illustrates this truth by two cases, as shown in the accompanying illustration. Plate VIII., Figs. 1-4, represents a young woman, aged nineteen, with extreme lordosis following paralysis of the spinal extensor muscles, and Figures 5, 6, and 7, an Italian woman, aged twenty-five, with pelvic deformity resulting from osteomalacia, and approximating in type a combination of the rachitic and kyphotic pelvises.

In the treatment of labor in a contracted pelvis with a conjugate diameter of $3\frac{1}{4}$ inches, Longaker¹ [correctly] prefers axis-traction forceps to version, as failure to deliver does not involve the sacrifice of the child's life. He believes that version should never be resorted to after forceps have failed, as in these cases there must be greater uncertainty of being able to deliver the after-coming head, which has been demonstrated by the failure of the forceps; there is also greater danger of rupture of the uterus from the operation after the waters have been drained away in the efforts at forceps delivery. Ballantyne² reports a case of induction of premature labor in a woman with a contracted pelvis, dilatation being secured by the use of glycerol intra-uterine injections and the Champetier de Ribes bag. Maygrier³ performed basiotripsy upon an after-coming head in a contracted pelvis, and Strassmann⁴ also perforated the after-coming head under similar circumstances. Bar⁵ performed a successful Cesarean section upon a woman with a rachitic pelvis, while Lardenois⁶ reports a spontaneous and easy delivery in a kyphotic primipara with marked contraction at the inferior strait.

Neugebauer⁷ has contributed an article upon the causes producing spondylolisthesis, and the differential diagnosis of this condition. Accident or injury in girlhood or adult life and marked rachitis are cited as frequent etiologic factors.

¹ Phila. Polyclin., iii., No. 24, p. 233.

² Edin. Med. Jour., July, 1894.

³ Jour. de Méd. de Paris, July 22, 1894.

⁴ Berlin. klinisch. Woch., July 2, 1894.

⁵ Jour. de Méd. de Paris, July 29, 1894.

⁶ Ibid., Sept. 2, 1894.

⁷ Zeitschr. f. Geburts. u. Gynäk., Band xxvii. Heft 2.

Cicatricial Contraction of the Vagina.—Kayser¹ reports two cases of conservative Cesarean section performed in the Giessener Frauenklinik, the indication for operation in the two cases being extreme stenosis of the vagina from scar-tissue and an imperfect atresia of the cervix resulting from preceding instrumental deliveries. Both patients had had puerperal fever, and had suffered from large vesicovaginal fistulæ that were later cured by operation. In the first case the result was good for mother and child; in the second both died—the mother from sepsis. Gardiner² reports a case of dystocia from complete atresia of the cervix uteri. No sign of an opening of the cervical canal could be found, and delivery was accomplished only by radiating incisions down to the membranes.

Double Uterus.—Interesting cases of this rare complication of pregnancy have been reported during the year by Tarnier,³ Von Dittel,⁴ Remfrey,⁵ and Owen.⁶ Tarnier's case was in her sixth pregnancy, with the following previous history: In the first pregnancy a living child was delivered in the seventh month, but died in a few minutes; the second delivery occurred at the beginning of the seventh month, the child living three months; the third delivery occurred in the seventh month, and the child is still living; the fourth delivery occurred at term, and the child lived six months; in the fifth pregnancy (twins) abortion occurred in the fourth month. The present pregnancy was complicated by menstruation continuing in the nonpregnant half of the uterus. Tarnier suspects that many cases of menstruation continuing during pregnancy can be explained in this way. [This is probably too strongly stated, as both a continuance of menstruation during pregnancy and the existence of a double uterus are of rare occurrence.] Von Dittel's case was characterized by a double vagina, the septum between the two vaginæ being torn through as the breech, which presented, descended. The bodies of the uteri seemed quite separate. Säger⁷ reports a case of supuration of a rudimentary second vagina during labor. A plastic operation performed nine months after labor resulted in a cure.

Inertia Uteri.—In making a diagnosis of this condition Bashaw⁸ directs attention to the fact that at times the head may appear to be advancing, when the apparent progress is due to great tumefaction of the caput succedaneum and not to movement of the head itself. In the treatment oxytocics are contraindicated in the first stage, while anodynes must be exhibited. In the second stage small doses of quinin, frequently repeated, are demanded, followed by the application of the forceps. Duff⁹ claims that he has obtained excellent results with strychnin as a prophylactic remedy in inertia. When there is general debility or a history of postpartum hemorrhage, he begins to administer strychnin from six to eight weeks before the expected time of

¹ Zeit. f. Geburt. u. Gyn., Bd. xxvii. Heft 2.

² Lancet, May 26, 1894.

³ Jour. des Sages-Femmes, March 16, 1894.

⁴ Centralbl. f. Gynäk., No. 25, 1894.

⁵ Trans. of the London Obst. Soc., Oct. 4, 1894.

⁶ Virginia Med. Month., Jan., 1895.

⁷ Centralbl. f. Gynäk., No. 38, 1894.

⁸ Am. Medico-Surg. Bull., July 1, 1894.

⁹ Pacific Med. Jour., July, 1894.

parturition, giving $\frac{1}{4}$ of a grain thrice daily until the last week of gestation, and then increasing the dose to $\frac{1}{8}$ of a grain. The appetite is improved, insomnia lessened, a shorter and less painful delivery insured, and the after-pains are diminished in severity. [The use of strychnin in our hands has not been attended with invariable success, although of decided benefit in certain instances.] Kielmann¹ advises the employment of manual pressure in these prolonged labor cases in order to accomplish engagement of the head in the superior strait. In order to secure this forcible engagement of the head profound chloroform-narcosis is required, the pressure being exerted in the axis of the pelvis—that is, in the direction of the concavity of the sacrum. Rémy² extols the effects of ammonium succinate in cases of protracted labor owing to spasmodic contractions of the uterus. He exhibits the medicament in doses of 1 gram (15 grains) in a potion of 140 grams (4 $\frac{3}{4}$ fluidounces), of which a tablespoonful is given every fifteen minutes until the spasm ceases. This remedy is said to be serviceable also for combating spasm of the internal orifice in the placental stage.

Accidental Hemorrhage.—O. von Weiss³ has made a study of premature detachment of the placenta, which he [rightly] considers as a condition of the greatest danger. Of 106 women in whom the accident occurred, 54 died, and of 107 children, all but 6 perished. The results of surgical interference are better than those of the expectant treatment, the mortality of the latter method being 74 per cent. as against 30 per cent. after surgical intervention. As regards the etiology, Von Weiss thinks that the premature detachment takes place because of exudation and degenerative changes dependent probably on kidney-insufficiency. Cases are reported by Reynolds⁴ and Bué.⁵

Acute Inversion of the Uterus.—Jewett⁶ states that in a recent study of 100 collected cases of inversion of the uterus, Beckman found that 54 occurred spontaneously, 21 after interference, and in 25 the cause was unknown. He believed the accident to be most frequent in primiparae and in young women. In this series of cases there were 14 deaths. In 2 of the cases the uterus was irreducible; in 4 the reduction was spontaneous. In 61 artificial reduction, and in 19 hysterectomy, was performed. Montgomery⁷ gives the frequency of the accident as 1 in 200,000 cases. Cases are reported by Montgomery,⁸ Pickel,⁹ and Jewett.¹⁰

Rupture of the Parturient Canal.—Merz¹¹ has collected out of current literature 230 cases of rupture of the uterus, in 181 of which a complete rupture of the organ was noted. Magnus A. Tait¹² regards this as the most dangerous complication of parturition next to rupture of the bladder.

¹ Jour. de Méd. de Paris, Oct. 7, 1894.

² Med. Week., iii. p. 132, 1895.

³ Archiv f. Gynäk., Bd. xlvi. Heft 2.

⁴ Boston Med. and Surg. Jour., vol. cxxx. No. 12.

⁵ Archiv. de Tocol. et de Gynéc., July, 1894.

⁶ Am. Medico-Surg. Bull., Feb. 15, 1895.

⁷ Birmingham Med. Rev., vol. xxxv., 1894.

⁸ Loc. cit.

⁹ N. Y. Jour. of Gyn. and Obst., Aug., 1894.

¹⁰ Loc. cit.

¹¹ Archiv f. Gynäk., Band xlv. Heft 2.

¹² Cincin. Lancet-Clinic, vol. lxxi.

Writers vary in their statements of its frequency, from 1 in 940 cases by Burns to 1 in 4000 cases by Harris [the latter probably being more correct]. According to most authorities, it occurs with the greatest frequency in multiparæ, but Tyler Smith found that it was as frequent among primiparæ as among women who had borne children. As regards treatment, Merz draws the following conclusions: 1. If the fetal body and extremities have escaped into the peritoneal cavity, the head remaining in or over the pelvic inlet, delivery should be effected *per via naturalis* by forceps or cranioclast. 2. If the head or entire fetus has passed into the peritoneal cavity, abdominal section should be done, and the contents thus removed. 3. In the latter case the uterine rent should be carefully sutured. 4. In the former case, if circumstances are favorable, abdominal section with suture of the rent should immediately follow delivery. 5. If the circumstances and condition of the patient are not propitious, no abdominal section should be performed, but irrigation and drainage by iodoform-wicking. 6. If the uterine rent is very ragged or the uterus is septic, Porro's operation is indicated. Merz's statistics give a recovery of 41.7 per cent. after suture, 53.3 per cent. without suture, and 53.3 per cent. after Porro's method.

Krajewski¹ lays down the following rules for treatment: I. Non-infectious cases. *a. Rupture Incomplete.*—(1) *Without Hemorrhage:* The rupture should be drained with iodoform-gauze and the vagina plugged with the gauze, the uterus being controlled by a firm abdominal binder. (2) *With Hemorrhage:* A firm packing of the retroperitoneal cavity and the vagina is to be first tried. This failing, resort should be had to the extraperitoneal incision of Bardenheuer in the fold of the groin. The retroperitoneal cavity is then to be cleansed of clots, the bleeding vessels ligated, and the cavity drained through both the vagina and the abdominal wall with iodoform-gauze. *b. Rupture Complete.*—(1) *Without Hemorrhage:* The uterus is drawn down with a volsella and put in anteversion or retroversion according to the situation of the rupture. The laceration, the uterine cavity, and the vagina are then packed somewhat firmly with iodoform-gauze, and a tight bandage is applied over the abdomen. (2) *With Hemorrhage:* The case must be treated by opening the peritoneal cavity. II. Infectious cases. *a. Rupture Incomplete.*—(1) *Without Hemorrhage:* The entire uterus should be removed by the vagina, its peritoneal covering being left intact. The cavity thus left is to be cleansed and packed with iodoform-gauze. (2) *With Hemorrhage:* The inguinal extraperitoneal incision of Bardenheuer is made, the hemorrhage controlled, and the uterus removed extraperitoneally. Extirpation through the wound proving impracticable, it may be done through the vagina, the peritoneum being left. Drainage is practised through the vagina and the inner end of the abdominal incision, the cavity being first disinfected. The rest of the abdominal incision is to be sutured and a gauze tamponade placed in the vagina. *b. Rupture Complete.*—Independently of the presence or absence of hemorrhage, the abdomen must be opened, the peritoneal cavity

¹ Nouvelles Arch. d'Obstet. et de Gyn., viii. année.

cleansed of blood and infectious material, and then, whatever the seat and extent of the rupture, the entire uterus should be removed, the peritoneum closed over the vaginal opening by suture, and the extraperitoneal cavity plugged from the vaginal side. Into the vesicorectal excavation produced by ablation of the uterus a Mikulicz sac may be introduced, its neck being placed in the inferior angle of the abdominal wound.

Cases are reported for the year as follows: Von Fernwald,¹ 2 cases treated successfully by abdominal section; Schönberg,² 1 case treated expectantly until the fifth day, when abdominal section was performed, which was shortly followed by death; the obstruction in this case resulted from a dislocated left kidney; Veredanski,³ 1 case, the patient dying of peritonitis in twenty-four hours without abdominal section; Piccinini,⁴ 1 successful case treated by abdominal section; Dow,⁵ 1 fatal case, not operated upon; Davis,⁶ 1 fatal case, the patient dying in three hours; Wasten,⁷ 1 successful case treated by abdominal section; Best,⁸ 1 fatal case, not operated upon. Dohrn⁹ reports a case of extensive rupture of the cervix extending into the left vaginal fornix, with bowel-protrusion. Vaginal tamponade was followed by recovery. Merz states that 7 out of 15 cases of ruptured uterus treated by the tampon recovered.

Cholmogoroff¹⁰ reports the following interesting case of complete rupture of the uterus: The patient was a multipara who had borne four children by difficult labor, the last of which was terminated by craniotomy, with laceration of the anterior wall of the neck of the uterus. The patient recovered completely in three weeks. Examination showed a just minor pelvis of moderate contraction. The fifth pregnancy progressed normally, but when labor commenced hemorrhage of moderate degree ensued. The patient was under the care of a midwife, who ruptured the membranes. The labor, however, failed to proceed, and the patient was brought into the hospital. On admission, examination showed the fetus with its long axis parallel with that of the uterus. The head could be felt above the usual position. No heart-sounds were present. On vaginal examination the mouth of the uterus was found fully dilated. In front and to the right could be felt a considerable portion of the placenta. The breech of the child was at the pelvic inlet, the sacrum directed posteriorly and to the left. The right foot was found on a level with the breech. Hemorrhage, although not excessive, persisted; accordingly the right foot of the fetus was grasped and extraction was immediately carried out. As the breech was an inefficient tampon, the hemorrhage continued. The extraction of the child was a most difficult one, and recourse was finally had to craniotomy upon the after-coming head, the

¹ Wien. klin. Woch., No. 54, 1894.

² Centralbl. f. Gynäk., Dec. I, 1894.

³ No. Am. Pract., Aug., 1894.

⁴ Il Policlinico, No. 21, 1894.

⁵ Jour. Am. Med. Assoc., May 19, 1894.

⁶ Loc. cit.

⁷ Bolnitschnaia gaseta Botkina, No. 24, 1894.

⁸ Lancet, April 13, 1895.

⁹ Centralbl. f. Gynäk., No. 11, 1894.

¹⁰ Zeitsch. f. Geburtsh. und Gynäk., Bd. xxxi. Heft 1.

opening of the skull being made through the palate. After the extraction of the child hemorrhage did not entirely cease, and an examination showed a transverse rupture of the uterus at the cervix. The placenta lay in the abdominal cavity among the intestines. The fetus also had been in the abdominal cavity. After the removal of the fetus and placenta the hemorrhage did not cease. The condition called for a choice between two methods of treatment, one by abdominal section, the other by the use of the tampon. As the fetus had been in the abdominal cavity for some little time, and the entire labor had not been conducted antiseptically, infection of the peritoneum was probable; this would indicate treatment by the tampon. On the other hand, the persistent hemorrhage called for suture of the ruptured uterus. With the idea of accomplishing all that could be done by both, the rent in the uterus was stitched through the vagina through the greater portion of its extent. A long glass tube was passed through the rent into the abdominal cavity, and the vicinity of the rent irrigated with a 2 per cent. solution of boracic acid. A Sims speculum was introduced, the borders of the rent seized with tenaculum-forceps, and the greater part of the rent closed by suture. At the left angle of the rent an opening sufficient to admit two fingers was allowed to remain. The bleeding immediately stopped. Through this opening iodoform-gauze was passed into the abdominal cavity, and the end allowed to remain in the vagina. The uterine cavity and that of the cervix were tamponed with iodoform-gauze; this was allowed to remain for four days, when it was removed and the vagina tamponed with fresh gauze. In eight days the tampon was removed from the abdominal cavity. The patient suffered from mastitis, but otherwise made a good recovery. Chalmogoroff draws attention to this combined method of treating complete rupture of the uterus as combining the advantages of both abdominal section and the use of the tampon. [The danger of sepsis must be considerably greater by such a method, and the control of hemorrhage more difficult. When practicable the usual method of abdominal section would be preferable.]

Baudry¹ reports a rupture of the rectovaginal septum without rent of the vulva or perineum. A plastic operation resulted in a cure. Maygrier² has encountered a symmetric perforation of the labia minora without involvement of the perineum. Budin has shown that this may result from a continuation of a rent starting from the hymen, while Sécheyron ascribes it to a stretching of the labia, which yield at their weakest part. Boyd³ urges immediate repair of all injuries to the pelvic floor under constant irrigation, with the use of sterilized Chinese silk for sutures, and the avoidance of wound-infection by placing the stitches without inserting the finger in the rectum.

Puerperal Eclampsia.—[This dangerous complication of labor has, as usual, been the subject of many interesting papers, although the exact eti-

¹ *Annales de Gynéc.*, July, 1894.

² *Jour. de Méd de Paris*, April 22, 1894.

³ *Ann. of Gyn. and Ped.*, May, 1894.

ology of the condition has not as yet been demonstrated.] Sir John Williams¹ and Chambrelent² both call attention to the hepatic lesions that are noted in fatal cases, and both lay stress upon the fact that the amount of albumin in the urine does not bear any relationship to the gravity of the case, although albuminuria is generally present. Chambrelent says that Bouchard is the author of the theory that eclampsia is due to the retention of toxic products that the kidneys and other excretory organs cannot eliminate. It was Bouchard who showed that the toxicity of the urine is diminished in cases of eclampsia. Chambrelent, as a result of his experiments since 1892, has found that while it requires about 10 cc. of blood-serum from healthy persons to cause death when injected into rabbits, it requires but 3 or 4 cc. of blood-serum derived from an eclamptic woman to kill a kilogram of rabbit. He suggests that the toxicity of the blood, when ascertained, may enable one to arrive at a prognosis in cases of puerperal eclampsia. Doria³ holds that in the uterus of a gravid woman, between the walls of the uterus and the membrane of the ovum, a morbid process is set up, with the production of lesions upon or in which bacteria belonging to the saprophytic group may develop. These bacteria are usually considered nonpathogenic. Along with this local process a form of toxemia is slowly developed, characterized by hemorrhages. Then follows localization of the bacteria in numerous hemorrhagic and necrotic foci within the spleen and liver. These microorganisms are identical with those contained in the uterus, and may give rise during life to gas as readily in one part of the body as in another. This gas may make its way into the circulation during life and so give rise to some of the symptoms of eclampsia. One of the most constant lesions met with in eclampsia is the presence of small hemorrhagic foci in the liver and spleen. These hemorrhages may be due to the microorganisms contained in them, or it may only be that the organisms have found a suitable nidus in the focus of dead tissue. The bacteria may produce hemorrhage through their toxins. Feis,⁴ who has studied the influence of accumulations of urea in the blood of the mother upon the uterus and the fetus, reports the results of his investigations made on animals. He concludes: 1. That urea has no power to cause uterine contractions—that it is harmless in the body, provided its free excretion is not prevented, though after large injections of solution of urea convulsions followed. 2. Regarding its influence on the fetus, after injecting the urea and while the mother was more or less convulsed, the uterus was rapidly opened; in each case the young were found dead. The animal was experimented on very near the normal time of birth. A chemie analysis of the fetal tissues showed urea in excess. In the human female, where there is diminution of the amount of urine, with retention of urea and other urinary substances in the blood, it is probable that besides eclampsia being produced therefrom, the fetus is poisoned by these materials transferred to it from the maternal blood.

¹ The Practitioner, Jan., 1895.

² Arch. clin. de Bordeaux, June, 1894.

³ Il Policlinico, March 1, 1895.

⁴ Archiv f. Gynäk., Bd. xlvii. Heft 1.

Kedarnath Das¹ has collected 101 cases of eclampsia occurring in the records of the obstetric wards of the Medical College and Eden Hospitals, Calcutta, from 1848 to September, 1894, in 10,728 deliveries, or 1 case of eclampsia to 106 deliveries [a much larger percentage than is generally encountered]. Most of the cases, 86, occurred among the native Indian women; 84 were in primiparæ, or 83 per cent. of the cases. Of the mothers, 59 died, or 58.4 per cent. Of 105 children, 55 were born dead, 45 living, and 5 were not mentioned whether born alive or not. This gives a fetal mortality of 52 per cent. An interesting case of the rare condition of eclampsia in both mother and child is reported from Schauta's clinic in Vienna by Woyer.² The patient was a primipara, and was admitted to the hospital partially comatose and suffering from eclamptic convulsions. Labor was hastened by an elastic dilator, and the child delivered by version; it was asphyxiated, but was resuscitated. The mother made a gradual recovery, and left the hospital two weeks afterward. Five hours after birth the child was taken with eclampsia, accompanied by tracheal râles and impaired respiration. The pulse rose to 144. In all the child had four convulsions at intervals of an hour or two, and died cyanotic with heart-failure after the fourth. The postmortem examination showed acute edema of the legs as the only lesion present. Bacteriologic examination of the various organs and examination of the urine found in the child's bladder gave negative results. The few cases of infantile eclampsia on record have ended fatally. [Three methods of treatment of puerperal eclampsia have claimed the attention of the obstetrician—namely, venesection, hypodermoklysis, and treatment by veratrum viride. The older remedy of bloodletting is, under proper precautions and in suitable cases, steadily growing in favor in the profession. Its indiscriminate employment alone is to be deprecated.] Recovery after venesection, with the removal of but sixteen ounces of blood in one case, and a quart and a half in another, is reported by McLeod³ and Dwyer.⁴ Ferré⁵ relates two cases of eclampsia, both of which were treated successfully by hypodermic injections of an 8 per cent. solution of common salt in distilled water. From 200 to 700 grams were injected at a time by means of Dieulafoy's apparatus. Ferré observes that "Porak believes that the introduction of a great quantity of saline water increases blood-tension, and in this way leads to reestablishment of renal secretion," but he himself is inclined to think that the diminution of renal secretion is the result of the eclamptic seizures, and that the introduction of large quantities of water acts as a nervine sedative by diluting the toxic matters in the blood and thus diminishing their power. The suspension of the attacks allows the circulation to recover its balance and the secretion to become reestablished; thus, as in Ferré's two cases, the periods of complete or partial suppression are succeeded by those of polyuria. [The accepted theory of the causation of

¹ Prov. Med. Jour., Feb. 1, 1895.

² Centralbl. f. Gynäk., No. 13, 1895.

³ Austral. Med. Gaz., May 15, 1894.

⁴ N. Y. Med. Jour., Jan. 5, 1895.

⁵ Nouv. Archiv d'Obstét. et de Gynéc., Sept., 1894.

puerperal eclampsia is an arteriole-contraction resulting from the presence of effete material in the blood. The contraction of the arterioles is general, as marked in the kidneys as elsewhere, and Ferré's conclusions are very plausible; the dilution of the toxic matters can very readily result in relieving the arterial tension, whereby capillary contraction will be diminished and the renal function reestablished.] Calderini¹ recommends, as soon as the labor is in progress, the administration of chloroform, hypodermoklysis of salt-solution (sodium chlorid 0.75 to 100.0 filtered and sterilized water), repeated injections of morphin hydrochlorate, the use of chloral by rectal injections, and the heating of the air that immediately surrounds the patient by the elevation of the bed-clothes and the employment of an alcohol lamp. [The employment of morphin injections is a dangerous method of treatment of this serious condition. While recommended by men of distinction and while employed with impunity in a number of instances, should serious organic disease of the kidneys coexist a rapidly fatal result may attend the administration of the drug.] Davis² records the results of the use of veratrum viride during twenty years' practice. He concludes that veratrum viride will control puerperal convulsions when administered in large doses, and that it is perfectly safe to administer it in sufficient quantities to control any case of convulsions. He employs the tincture of the drug in doses of from 20 to 60 drops. [Veratrum viride has undoubtedly come to stay in the treatment of puerperal eclampsia. It exerts a powerful influence, when administered in large doses, in controlling the eclamptic seizures.] Krönig³ recommends the symptomatic treatment of the disease, and states that the average mortality by this method of treatment is from 20 to 30 per cent. He believes that while the convulsions are controlled by narcotics, the eclampsia, as such, continues to exist. The course of the condition can be unfavorably influenced by large doses of narcotics, and in the Leipziger Klinik the treatment by morphin has been abandoned for one and a quarter years, its place having been taken by forcible delivery in the eclampsia of pregnancy or of labor. Narcotism is employed only during the operation, and in threatened pulmonary edema venesection is practised, with the abstraction of from 600 to 800 grams of blood. Arnold⁴ claims that while elimination by the bowels is very valuable, it is not immediately available as a rule. He prefers the use of the hot pack, and, if this does not act promptly, the administration of pilocarpin in small doses. [Pilocarpin, owing to its uncertain action, is as dangerous, or even more so, than is morphin in this disease. Should it act upon the bronchial mucosa, a fatal edema may quickly supervene.]

Sudden Death during Labor and the Puerperium.—Vinay⁵ divides the causes of sudden death during labor and the puerperium into four classes, as follows: Embolism of the pulmonary vessels; entrance of air into the

¹ Centralbl. f. Gynäk., No. 20, 1894.

² Virginia Med. Month., April, 1894.

³ Centralbl. f. Gynäk., April 21, 1894.

⁴ Bost. Med. and Surg. Jour., July 12, 1894.

⁵ Lyon méd., Nos. 45, 46, 1893.

veins; syncope, shock, and other affections; intracranial hemorrhage, violent spitting or vomiting of blood, large pleural effusions, rupture of a liver-abscess.

FETAL DYSTOCIA.

Over-size of the Fetus.—La Torre¹ remarks that up to the present time the development of the fetus has only been studied on the maternal side, the paternal side having been forgotten or neglected. This [he rightly concludes] is not rational, for the product of conception is the result of union and fusion of both male and female elements. The influence of the father is more marked in the physical development, that of the mother on the moral and intellectual faculties. The father exercises his influence in health and disease alike. La Torre shows that when the father, at the time of fecundation, is well and strong, it favors the development of the fetus, no matter what may be the condition of the mother. The average weight is 3500 grams in these conditions; on the contrary, when the father is sick the product of conception is arrested in its evolution, and the mean weight is 2600 grams, a mean difference of 900 grams. On the other hand, it is known that the dimensions of the head are in relation to the weight of the body: heavy weight, large head; light body, small head. For example, for a fetus of 3500 grams the biparietal diameter is 9 cm. 5 mm., and the bitemporal 8 cm., while for a fetus of 2600 grams the biparietal diameter is 9 cm. and the bitemporal 7 cm. Now, taking the means of the cranial dimensions of fetuses weighing between 3000 and 5000 grams, as has been done up to the present time, a large number of fetuses weighing under 3000 grams and produced by diseased fathers have not been counted in. The means of the dimensions of the fetal head as given to-day are biologically inexact; this is also true in the anthropologic point of view. In reality, it has been demonstrated that there are men with large and small heads; it has also been shown that, of all the parts of the body, the head is what is unchangeably transmitted, in such a manner that a large-headed father cannot, except in a state of disease, procreate children with small heads, and *vice versa*. Now, by taking the means of cranial dimensions of fetuses with large heads, and consequently over 3000 grams in weight, we neglect small heads belonging to fetuses procreated by small-headed fathers. The means actually given are not exact. It is consequently necessary, in order to be logical, to consider the development of a fetus biologically and anthropologically by two means—one taken from the heads of fetuses weighing from 3000 to 5000 grams, the other from fetuses varying from 2500 to 3000 grams.

Gönnér² has measured the pelvis, the head, and the height of one hundred pregnant women, and compared them after labor with the measurements of the child's head and its weight. He finds that a relation between the head-index of the mother and that of the child does not exist. In only 29 per cent. did the head of the child belong in the same category as that of the

¹ Annals of Gyn. and Ped., Aug., 1894.

² Zeitsch. f. Geburts. u. Gynäk., Band xxviii. Heft 2.

mother. In deformities of the pelvis one cannot estimate from the size of the mother's head that of the child's, and thereby prognosticate an easy or a difficult labor. With increased height of the mother the weight of the child increases. Large heads are often encountered in children with usual-sized bodies.

Fetal Tumors.—Wörz¹ records a case in which delivery was hindered by a large lymphangioma of the neck passing beneath the clavicle and appearing to the extent of the size of a hen's egg above it. The scapula was pushed away from the ribs; the clavicle had an angular bend and was partly separated from its sternoclavicular attachment. The child lay in the second transverse position, and was delivered with difficulty by traction after version, dying during the process. Walther² reports dystocia due to extraordinary development of the fetal bladder, with excentric hypertrophy of its walls, associated with ascites. The child was otherwise deformed.

Multiple Pregnancy.—Boyte³ reports an interesting case by which the hypothesis of superfetation is proved to be possible and true. After delivering a woman of a child at full term he proceeded to expel the placenta by Credé's method. There came away with it, in a separate sac, a fetus three or three and a half months old. The two placentas were apparently attached to each other at their margins by a substance resembling the jelly of Wharton. The placenta and fetus were in a healthy condition, and the circulation was independent, as there was no anastomosis between the vessels. A similar case is recorded by Dufour,⁴ a living fetus of six months being expelled together with an embryo of three months in a separate sac. Callahan⁵ reports the birth of one twin forty-eight hours after the birth of the first. Mirabeau⁶ has found that triple births are most common (1 to 6500) in multiparous women between thirty and thirty-four years of age, the pregnancy being usually preceded by a long interval of sterility. Women who bear triplets usually come of families in which plural pregnancies are hereditary. Duplex uterus is believed to be a predisposing factor. The more fertile a community—that is, the larger the number of multiparous women—the more common are triple births. In Russia the number of these is 1:4054; in Sweden, 1:4400; in England, 1:4600; in Germany, 1:7129; in France, 1:8256. Bousquet⁷ has encountered a quadruple pregnancy, all four children being born alive and nourished by the help of three wet-nurses.

Abnormal Vertex Positions.—Marx⁸ believes that occipitoposterior positions of the vertex are of more frequent occurrence than is generally stated. In these cases postural treatment is often all that is necessary to secure perfect flexion of the head and to overcome uterine obliquity. In

¹ *Centralbl. f. Gynäk.*, No. 5, 1894.

² *Zeitschr. f. Geburts. u. Gynäk.*, Band xxvii. Heft 2.

³ *Charlotte Med. Jour.*, Jan., 1894.

⁴ *La Méd. mod.*, Aug. 3, 1894.

⁵ *New York Med. Jour.*, lix., No. 23, p. 721.

⁶ *Ueber Drillingsgeburten*, München, 1894.

⁷ *Jour. de Méd. de Paris*, May 27, 1894.

⁸ *Med. Record*, May 12, 1894.

case the head is above the pelvic brim, he prefers complete podalic version in preference to attempts at anterior manual rotation. When the head is fixed at the superior strait the Tarnier axis-traction forceps should be applied and traction made; as the head descends the blades rotate with it, so that in a short time they are placed inversely. The head lying in the pelvic basin, an attempt should be made to rotate it in the natural manner by the application of the Tarnier instrument; this failing, a forcible rotation with forceps might be attempted. Should the head lie low down upon the pelvic floor, it must, as a rule, be delivered as a posterior case.

Muret¹ gives the following etiology for transverse positions of the vertex in the inferior strait of the pelvis: 1. Primary transverse positions occur in nonrachitic but flattened pelves when the fetal head is greatly developed (also in pelves having a double congenital dislocation of the femurs); in flattened and generally narrow pelves; in funnel-shaped pelves, "*en entonnoir*;" and when there is a large pelvis and a small head. 2. Secondary transverse positions occur in occipitoposterior presentations arrested during their rotation; when there exist large heads; and when there is an insufficiency of pains. 3. Mixed cases: when there coexist a flattened pelvis and an occipitoposterior presentation arrested during rotation. The treatment should be expectant as long as possible. Hygienic measures and the lateral decubitus should be adopted. Stimulants should be given to fortify the patient and bring on the pains. Kristeller's method of uterine expression may be practised. The forceps, if used, should never be applied in the anteroposterior diameter, but in one of the oblique pelvic diameters. Simple traction should be made until the head is in the soft pelvis, and then the forceps removed. In cases of transverse positions of the pelvis Muret's manual method may be employed. It consists in dragging the occiput forward while with two fingers of the left hand in the rectum the forehead is pushed toward the perineum.

Breech Presentation.—Pinard² suggests a new sign of breech presentation. He asserts that when, in a woman who has passed the sixth month of pregnancy, a sharp pain is produced by placing the hand on the fundus uteri, it may be almost affirmed that there is a breech presentation. The fact is very frequent, although not constant, being present in about 70 per cent. of cases. The pain is sometimes spontaneous, and if version is performed it disappears. [This lacks confirmation by other observers.]

Pulvermacher³ directs attention to the fact that in many cases of breech presentation the head of the child is found in such position that the occiput, resting partly or wholly upon the pelvic wall, is bent at an angle to the neck, and that the hand can only feel an ear and the presenting part of the cheek or the zygoma. In such cases Pulvermacher extracts the head by the following procedure: A dull double hook is guided by the hand to the region of the zygoma, somewhat beneath the infraorbital margin, and the blunt end of the instrument, which is hook-shaped, is with the hand in the

¹ Rev. méd. de la Suisse Rom., xiv., No. 1, 1894.

² La Clinique intern.

³ Centralbl. f. Gynäk., No. 29, 1894.

vagina firmly pressed against the head, while on the opposite hook-shaped end, which projects from the genitals, firm traction is made by the other hand. The nurse makes traction during this time with one hand on the legs of the child, directing it downward, and presses with the other hand through the abdominal walls upon the head. The face turns immediately toward the sacral hollow, and the child's head will rapidly be delivered.

Kötnitz¹ calls attention to the frequency of *caput obstipum*, or wry-neck, after breech-birth. It may be due to lesions, including hematomata, of the sternomastoid muscle, and may appear immediately at birth as a result of intrauterine influences, or it may appear postpartum, or be first observed some time afterward, apparently in consequence of lesions of the muscle caused by the forces of labor. Asymmetry of the skull and wry-neck may coexist and be congenital. Pincus² reviews the literature of this subject, and has collected reports of 43 cases. He finds that this complication was early recognized by obstetric writers. Injuries to these muscles sufficiently severe to cause evident symptoms are relatively rare. A distinction is to be made between primary rupture of the sternocleidomastoid muscle, followed by inflammation, and traumatic myositis, either circumscribed or diffuse. Inflammation of the muscle is by far the more important. In establishing a diagnosis it is necessary to determine accurately the time after delivery when this injury was first noticed. Syphilis has nothing to do with causing this condition. There is no doubt that it follows traumatism. Torsion of the child's body is the most important mechanical cause, while, as accessories, are the weight of the child, traction with forceps or with the fingers, traction upon the umbilical cord when wrapped around the child and passing over the muscle. In examining a given case one must keep in mind congenital variations in these muscles, and especially shortening, sometimes seen at birth. The frailness of these tissues to injury must also be kept in mind. The Schultze method of resuscitating children has not been observed to cause injury to these muscles. The manner in which this injury occurs is clearly understood. In the first position of a vertex presentation the muscle of the left side is most usually injured, while with the second position the muscle upon the right is exposed. In breech presentation with the first position the right muscle is often wounded, while with the second position of breech presentation the muscle of the left side is most exposed. So far as medicolegal medicine goes, injury to these muscles at birth is of no special importance in determining the presence or absence of wilful injury to the fetus. Injury to the sternocleidomastoid muscle only exceptionally causes persistent torticollis. These cases of torticollis usually develop after stretching and wounding of the muscle. The treatment of this complication of labor is essentially prophylactic. The obstetrician must use properly made forceps correctly shaped. In obstetric manipulations twisting of the child's neck or forcible torsion of the trunk must be carefully avoided.

¹ Volkmann's Sammlung, No. 88, 1894.

² Zeitschrift f. Geburtsh. u. Gynäk., Band 31, Heft 2, 1895.

Face Presentation.—Davis¹ remarks that the frequency of face presentation is variously estimated as 1 in 130 confinements by German observers; 1 in 276 by French; and 1 in 292 by British obstetricians. In the management of these cases, when treatment by simpler procedures is out of the question, Davis favors the performance of symphysiotomy. This operation results in a decided increase in the oblique diameter of the pelvis. Remembering the observation by many obstetricians that face presentations are often developed out of occipitoposterior positions, he suggests that any surgical procedure, such as symphysiotomy, which would enlarge the oblique diameters of the pelvis, and which naturally favors the descent of the occiput in the arc of the pelvic curve lying between the sacroiliac joint and the spine of the pubes, would afford rectification of this abnormal presentation. Were the spontaneous progress of labor in face presentation to fail, he would prefer, if the pelvis were of good size and the head not impacted, to perform podalic version; or, if the head were impacted and disproportion existed between the head and the pelvis sufficient to occasion difficulty in labor, he would attempt symphysiotomy, convert the face presentation into a vertex presentation, and deliver the occiput in the usual manner. [At present symphysiotomy appears to be an excellent alternative to craniotomy in these difficult cases of face presentation, as well as in some graver cases of persistent posterior vertex positions.] In mentoposterior positions with the face well engaged Volland² suggests the following manipulation: The hand corresponding to the side of the mother from which the chin is turned is introduced and the face firmly grasped, the index finger being hooked under the chin. During an interval between the pains the chin is forcibly rotated forward as far as it will go, and held here during the following pain. The effort at rotation is maintained, and at the same time an effort is made to draw the chin down. In the following interval the same procedure is continued. The progress may be slow at first, but after several pains the face will gradually be brought into the transverse diameter of the pelvis, when, there being no longer sufficient space for the whole hand, with the index finger hooked under the chin the latter is pressed forward and pulled downward until it emerges under the pubic arch, when no further difficulty will be experienced.

Anomalies of and Accidents to the Cord.—Bruttan³ has seen a number of cases of coiling of the funis around the fetus. At Dorpat this complication occurs in the proportion of 1 to 3.49 labors. This coincides with the fact that in Estonian women the cord is often very long (average 22½ inches). Direct strangulation of the child through coiling of the cord around the neck is extremely rare; the danger is due to the risk of compression of the funis between the child and the maternal passages or between two parts of the child.

¹ Med. News, July 14, 1894.

² Therap. Monatshefte, No. 8, 1894.

³ Berichte aus der Universitäts Frauenklinik zu Dorpat, 1895.

Funke¹ observed a remarkable case in Freund's wards at Strassburg of spontaneous intrauterine laceration of the cord, which had been torn off at the umbilicus, the abdominal cavity not being opened. The cause of the injury was not determined. A dead and slightly fetid fetus was delivered twenty-four hours after the accident. Pfeiffer² reports a rare case of precipitate labor with rupture of the umbilical cord and inversion of the uterus; the latter was readily reduced, and an uninterrupted recovery followed.

OBSTETRIC OPERATIONS.

The Induction of Abortion and Premature Labor.—*Indications.*—Barnes,³ in considering the indications for the premature termination of a gestation, mentions first in the list conditions attending excessive nervous tension, one of the first evidences of which is vomiting. When this vomiting is associated with or dependent upon marked functional or structural disease of organs, the condition is especially serious. The signs of danger are extreme emaciation; pulse small, easily put out, over 130; hollow, staring eyes; Hippocratic aspect; delirium. Convulsion is mentioned next, and of all the forms that are presented, those in which albuminuria is an efficient factor (eclampsia) leave the least room for doubt. The danger here is twofold—imminent danger to life, and, life being saved, the highly probable danger of permanent disease of the kidneys. Tetanus is a strong indication for the induction of labor, as are also marked chorea and epilepsy. Marked emotional proclivities tending to insanity may or may not be taken as an indication for the operation. Barnes has seen gestational mania quickly vanish on the termination of pregnancy, while Savage says such a procedure will almost certainly convert a case of insanity of pregnancy into a case of puerperal insanity. High vascular tension with ultraphysiologic changes in the characters and quantity of the blood, giving rise to the danger of cardiac exhaustion or clotting of the blood from its hyperinotic condition, may occasionally demand operative interference. Grave constitutional or organic disease threatening maternal life, and the history of repeated pregnancies ending prematurely or at term in the birth of a dead child, are additional reasons for taking the initiative. As Barnes remarks, the subject is one of vital interest, each case meriting careful thought. [The foregoing classification is virtually that adopted by all obstetricians, and does not in any respect merit the claim of originality.]

Methods.—The dangers attendant upon the recently suggested method of Pelzer⁴—namely, the injection of about five ounces of glycerol between the membranes and the uterine wall—are daily becoming more manifest. This method was supposed to have a threefold action: Uterine contractions were induced by direct irritation of the uterine surface, by the mechanical separation of the membranes from the uterine walls, and by transudation of the liquor amnii owing to the hygroscopic qualities of glycerol, thus lessening

¹ Centralbl. f. Gynäk., No. 31, 1894.

² Am. Medico-Surg. Bull., Sept. 15, 1894.

³ Lancet, Aug. 11, 1894.

⁴ Archiv f. Gynäk., No. 42, part 2.

the bulk of the ovum and favoring further separation of the membranes. While the action of the injection is certain and quick, and the glycerol is antiseptic and a lubricant, certain objectionable features have developed from its employment. Afanassiew has found that in dogs glycerol produced hemoglobinuria, glomerulonephritis, and even interstitial nephritis, and fatal results following its use as suggested by Pelzer have been reported by Pelzer himself,¹ Pfannenstiel,² and Embden.³ The toxic symptoms following the injection are chill, fever, violent vomiting, and the symptoms of acute nephritis with decomposition of the blood. It has been conclusively demonstrated by Schwann, Luchsinger, and others that glycerol is liable to cause a decomposition of the blood, and examination of the urine and blood in the fatal cases sustains their conclusions. Particularly in cases in which albuminuria or nephritis has preexisted is there greater danger of the development of toxic manifestations. Additional dangers attendant upon the use of glycerol are the production of thrombosis when introduced into the circulatory system, and the introduction of air into the circulation with any kind of fluid injection between the uterus and fetal sac. Theilhaber⁴ suggests a modification of Pelzer's method in which the glycerol is introduced into the uterus in the form of bougies of fish-bone covered with a thin layer of 1 per cent. of mercuric-bichlorid collodion. Over this is a mixture of 5.9 per cent. glycerol and gelatin, which to prevent moulding is mixed with 2 per cent. trikresol. The bougies are packed in waxed paper that is smeared within with 3 per cent. trikresol vaselin. Theilhaber has prepared a second variety of bougie containing as a nucleus a 15 cm. fish-bone, and coated with 7.5 grams of glycerol and gelatin. In one case in which these bougies were used excellent results were obtained. [Until more complete reports upon the merits of this modification of Pelzer's method are received, the use of glycerol as a means of inducing labor should in the interests of the patient be abandoned.]

Boissard,⁵ at a meeting of the Société Obstétricale et Gynécologique de Paris, presented a new method of inducing premature accouchement by means of an instrument which is described as follows: The instrument is composed of an aluminum tube of some grams weight, twenty-five centimeters long, the end drawn out and shaped to a flute mouth. This portion is intended to be introduced into the uterus. Its exterior is curved and has a ring six centimeters from the end, which gives the measure of its introduction into the cervical canal; when this touches the os externum the flute-like point is in the uterine cavity. In this conducting tube is placed a caoutchouc tube with an ovoid ampullar extremity, thin and very dilatable. When the instrument is to be employed the rubber tube is covered with vaselin and is placed inside the metal, projecting a little beyond the flute-like end. The instrument is passed by the left hand into the vagina, and the flute-like end

¹ Loc. cit.

² Centralbl. f. Gynäk., No. 4, 1894.

³ Med. Record, July 28, 1894.

⁴ Centralbl. f. Gynäk., No. 20, 1894.

⁵ Répertoire univers. de Obstet. et de Gynéc., No. 4, 1894.

into the cervical canal until the ring rests against the external os. The rubber tube is then injected, and, as it fills, the ovoid end protrudes and gradually makes its way upward to the internal os. The metal tube is then withdrawn, the rubber balloon being left in place. Boissard claims an infantile mortality of 8 per cent., with absence of complications on the part of the mother. No change in fetal presentation has been observed. Moussous¹ has devised an instrument for the same purpose, similar to the preceding and modelled after the instruments of Tarnier and Champetier. It is shown in the accompanying illustration. [The objections to both of these instruments is the slowness of their action and the danger attendant upon rupture of the bag while inserted.]

Symphysiotomy. — *History.* — This obstetric procedure, very generally known as the Sigaultean operation, has undergone a most remarkable revival during the last two years. Originating² in a suggestion by Pineau in his work on Surgery in 1598, it was first performed by La Courvée in 1655 upon a dead body in order to save the child, and afterward by Plenck for the same purpose in 1766. "In 1777, Sigault first proposed the operation to be done on the living, and Ferrara was the one to carry out practically the proposition," although Sigault is generally considered to be the first symphysiotomist. From that time to 1858, when the operation had practically died out, it had been performed 85 times with a recorded mortality of 33 per cent. In 1866 the Italians, under the leadership of Professor Ottavio Morisani of Naples, revived the operation, and in twenty years had performed it 70 times with a mortality of 24 per cent. The improvement under a rigid antiseptic technique is shown by the fact that under the last 38 operations (1886-91) there were but 2 women lost, or $5\frac{1}{3}$ per cent., while the infantile mortality was $10\frac{2}{3}$ per cent. In France, Pinard in 1892 performed the first symphysiotomy since its abandonment in 1858, and operators in other countries of Europe and in America quickly followed his leadership. This extension of the work into other countries took place in the following order: Germany, Austria, Russia, United States, Denmark, Brazil, Ireland, Switzerland, Holland, Canada, and India—all in the year 1892. While there is some controversy as to who performed the first operation in this country, both the editor of the Medical News³ and Dr. Harris,⁴ the famous obstetric statistician of Philadelphia, believe that Dr. Coggins's claim to priority is invalid, and that the first American symphysiotomy dates back over fourteen years, Dr. J. O.



FIG. 7.—Moussous' apparatus
(Jour. de Méd. de Paris, Feb. 24, 1895).

¹ Jour. de Méd. de Paris, Feb. 24, 1895.

² Winterberg, Med. News, Jan. 12, 1895.

³ Editorial, Med. News, June 22, 1895.

⁴ Brooklyn Med. Jour., Sept., 1894.

Williams of William Penn, Texas, having undoubtedly and successfully operated first in 1880, again in 1884, and a third time in 1889. G. Rothwell Adam¹ claims to have been the pioneer operator in Australia, if not in the Southern Hemisphere, having performed the operation on Dec. 21, 1893.

Statistics.—The earlier statistics of the revival of symphysiotomy show a higher mortality than would at present be expected. In an address delivered on Nov. 17, 1893, before the Washington Obstetrical and Gynecological Society, Hirst reports 212 operations since 1887, with 27 maternal deaths, a mortality of 12.73 per cent., and a fetal mortality of a little over 28 per cent. Tarnier² reports 124 cases with 12 maternal deaths and 32 infantile deaths. In his later statistics Morisani gives 55 cases with 2 maternal deaths and 1 infantile death, while Zweifel³ reports 14 cases from the Leipzig Clinic, with no maternal death and 2 fetal deaths, one from asphyxia and one from pneumonia two days after birth. Puech reports 73 cases, with a maternal death-rate of 4.1 per cent. and an infantile mortality of 24.6 per cent. Porak⁴ reports 9 cases with 2 maternal deaths, one of which he claims was not due to the operation. Pinard at the Eleventh International Medical Congress reported 36 cases, including symphysiotomy, pubiotomy, and ischiopubiotomy, with 2 maternal and 4 fetal deaths. Buschbeck⁵ reports 6 cases with 1 maternal death; Shah,⁶ 1 case, with recovery of the mother, but death of the child with high temperature and difficult breathing; Harris,⁷ 2 successful cases; Jarman,⁸ 1 successful case; Engstroem,⁹ 1 successful case; Wheeler,¹⁰ 1 successful case; Rector,¹¹ 1 case, the mother surviving, but the child dying in six hours; Bar,¹² 1 successful case; Gaulard,¹³ 2 cases, both mothers and children living; Collyer,¹⁴ 1 successful case; Garriques,¹⁵ 1 successful case; Davis,¹⁶ 2 successful cases; Wallich¹⁷ and Toujari,¹⁸ each 1 successful case; and Winterberg,¹⁹ 1 case. In the United States there have been thus far reported 75 operations, with a loss of 10 women and 18 children.

Dr. Robert P. Harris²⁰ writes as follows: "The best encouragement for the performance of symphysiotomy is to be found in certain centers where there have been many maternity cases in the hands of a few men. The

¹ Australian Med. Jour., May 20, 1894.

² Annales de Gynéc. et d'Obstet., 1893.

³ Centralbl. f. Gynäk., No. 22, 1893.

⁴ Jour. de Méd. de Paris, Jan. 6, 13, 20, 27, Feb. 3, 1895.

⁵ Münch. med. Woch., No. 25, June 19, 1894.

⁶ Indian Medico-Chirurg. Review, No. 8, 1894.

⁷ Am. Jour. Obs., vol. xxx., No. 6, 1894.

⁸ Trans. N. Y. Obst. Soc., Oct. 2, 1894.

⁹ Ann. de Gynéc., Dec., 1894.

¹⁰ Boston Med. and Surg. Jour., vol. lxxxi., No. 26, 1894.

¹¹ N. Y. Med. Rec., May 18, 1895.

¹² Jour. de Méd. de Paris, Feb. 3, 1895.

¹³ Arch. de Toccol. et de Gynéc., No. 5, 1894.

¹⁴ Am. Medico-Surg. Bull., Feb. 15, 1895.

¹⁵ Med. Record, Nov. 10, 1894.

¹⁶ Med. News, No. 15, 1894.

¹⁷ Ann. de Gyn. et d'Obst., Aug., 1894.

¹⁸ Ibid., March, 1894.

¹⁹ Med. News, Jan. 12, 1895.

²⁰ Editorial, Med. News, June 22, 1895.

Clinique Baudelocque has a staff of six obstetric surgeons, who up to December, 1894, had performed 48 operations, of which Professor Pinard had a credit of 25. He lost his ninth and seventeenth patients, or 8 per cent. of his cases, and the eighteenth child. The other five operators lost 2 women out of 23, and 3 of their children. The whole mortality is $8\frac{1}{2}$ per cent. each of the women and of the children. Professor Pinard says in his last report that of the 48 women, 37 were 'exclusively examined and cared for at the Clinique Baudelocque,' and of those 37 only 1 died, and she of intestinal obstruction produced by fibrous band; the children were all born alive. In Professor Paul Zweifel's clinic at Leipzig there were 21 symphysiotomies in fifteen months prior to January 1, 1894. Of the 21 women, Professor Zweifel operated on 18, and his three assistants on 1 each. No woman died and 4 children were lost; the children lost were delivered by the professor. The most encouraging work in symphysiotomy in the United States has been that of New York City, where 10 operators saved 19 out of 21 women, and 18 of their children. One of the 2 deaths was unavoidable, the patient being *in extremis* when brought to the hospital; the other died of sepsis due to the operation. It is fair to New York to count out the first case of Professor W. T. Lusk and give her 20 operations with 1 woman and 2 children lost, a mortality respectively of 5 and 10 per cent. There is much credited against this form of operation that is due to the prior condition of the patient or to injuries produced in a hurried delivery of the fetus. There have been 80 deliveries in North America, with 10 women lost, and of these 10 only 4 can be fairly charged against the operation *per se*."

Indications.—Morisani¹ gives as the limits of symphysiotomy a conjugate diameter of from 8.8 cm. to 6.7 cm. Leopold rejects the operation altogether in primipare, and in cases of flat pelvis in multipare gives the limits of $7\frac{1}{2}$ cm. to 6 cm. Garrigues² remarks that symphysiotomy may render good service under other circumstances than a narrow pelvis, such as pelvic tumor, occipitoposterior position, impacted mentoposterior face presentations, ear presentations, and eclampsia. The average weight of new-born children is considerably greater in America than in Europe; hence in this country we cannot perform the operation in degrees of pelvic contraction as low as European accoucheurs do, and the upper limit must also be placed higher. [Seven centimeters is probably the lowest limit at which the operation may be performed with safety.]

As to the choice of symphysiotomy or of some other operation much has been written. Noble³ claims that in good hands the mortality of induced labor does not exceed 1 per cent., and that symphysiotomy, although giving a general mortality of 10 per cent., should, if properly performed, not result in a higher death-rate than 1 per cent. While the maternal mortality of the two operations in good hands is about the same, the chances of fetal life are much greater in the latter than in the former operation. A large proportion (about $66\frac{2}{3}$ per cent.—Winkel) of premature children die within a few

¹ Loc. cit.² Loc. cit.³ Annals of Gyn. and Ped., July, 1894.

months of birth, while in symphysiotomy the fetal mortality is but 20 per cent. (Garrigues). The mortality of Cesarean section, even in the hands of the most skilled operators, is 8 per cent., while Porro's operation shows a maternal mortality of 37.78 per cent. and an infantile mortality of 22.4 per cent. With version also, it is difficult to extract a living child through any appreciable pelvic contraction. It would therefore appear that symphysiotomy gives the better chances of life to both mother and child. [Symphysiotomy is an alternate of craniotomy, and not of Cesarean section, although the performance of the latter in preference may in exceptional cases become one of wisdom.]

As Dr. Harris¹ says, "Paris and London are in direct antagonism in regard to the choice between embryotomy and symphysiotomy. Professor Pinard advocates the abandonment of infantile destruction as a preparation for delivery, and hopes in the perfection of symphysiotomy to accomplish his purpose. London, voiced by Dr. Peter Horrocks and other Fellows of the Obstetrical Society, takes an entirely opposite ground, as shown by a discussion at the meeting of March 7, 1894. England prefers craniotomy to pubic section, and several Fellows claimed that there were less immediate and subsequent danger and disability after the Cesarean section than after symphysiotomy. There would be good reason for advocating this preference if English operators had the success of a Sanger or a Zweifel, but London Cesarean sections in the recent past have had a mortality of 38 per cent. in the women and 27 per cent. in the children, and as this is since January 1, 1886, it may be considered a fair estimate."

Methods.—The Italian or subcutaneous method, as advocated by Morisani, has more generally come into favor than has the German or open method, whose chief advocate has been Pinard. The advantages of the former consist in the smaller wound and the nonexposure of the separated cartilaginous surfaces to atmospheric contact. Bensinger² strongly objects to the use of bone sutures. Catgut he regards as insecure and too quickly absorbed; wire will contuse or crush the porous bone-tissue of the symphysis; but the greatest objection to suture into the bone is that in symphysiotomy the wound must be drained. Experience shows that bone sutures, if not in absolutely closed wounds, invariably suppurate. He would therefore urge careful closure of the fascia and soft parts with silk button-stitches and the application of a firm fixation-bandage of elastic webbing, 25 cm. broad, edged with drilling and furnished with buckles. Morisani at the Eleventh International Medical Congress determined the limit of pelvic contraction within which symphysiotomy is justifiable as from 8.8 cm. to 6.7 cm. Ischiopubiotomy, or Farabeuf's operation, he regards as a precious resource in cases of narrow pelvis produced by ankylosis of one of the sacroiliac symphyses (the oblique pelvis of Nagele).

Fenomenow³ proposes to preserve permanently the new diameters obtained by symphysiotomy. He suggests either of two methods, as fol-

¹ Loc. cit. ² Centralbl. f. Gynak., No. 7, 1894.

³ La Semaine medicale, Feb. 9, 1894.

lows: 1. A semilunar incision is made through the skin of the pubic region, extending from a point situated internally to the external abdominal ring on one side, about a finger's breadth above the level of the upper border of the pubic bones, to the corresponding point on the opposite side, the lowest part of the incision touching the inferior border of the symphysis pubis. The flap of skin having been raised from the subjacent muscles, the remaining soft structures are incised from above downward and from without inward, about an inch on either side of the middle line of the symphysis pubis, in such a manner as to include a triangle, the base of which is formed by the upper border of the symphysis, while the apex corresponds to the subpubic ligament. The periosteum having been detached from the bone, a wedge-shaped piece is cut out of the two pubic bones with the chisel or the chain-saw, the apex of the wedge being likewise directed downward so as to include the interarticular fibrocartilage. The arciform or subpubic ligament is then divided if necessary, the ligament being left entire in cases in which it offers no obstacle to the separation of the pubic bones. This part of the operation is completed by plugging the wound with iodoform-gauze, after which the extraction of the uterine contents is proceeded with. After delivery the periosteum is carefully detached with a scraper from the lower half of the wedge-shaped piece of bone, the denuded portion of which is excised. The detached periosteum is brought down upon the cut surface of the quadrilateral piece of bone left after excision of the lower half of the wedge, while the latter is made to slide down upon the cut surfaces of the pubic bones so that the lower side of the bony trapezium comes to form the interior border of the symphysis, which is thereby reduced to half its original height, seeing that its upper border is now formed by the upper side of the bony trapezium. The distance between the two pubic bones after the operation varies from $\frac{4}{5}$ of an inch to an inch, according to the breadth of the bony wedge. 2. The skin-incision is the same as in the first method, but instead of cutting a wedge-shaped piece out of the pubic bones the latter are divided vertically from their upper border as far down as a point on a horizontal plane with the center of the symphysis, the two vertical incisions being subsequently united by a horizontal cut. In this way a rectangle of bone and periosteum is obtained, the horizontal sides of which are from $1\frac{2}{3}$ to $1\frac{4}{5}$ inches long, while the vertical sides are equal to half the height of the symphysis. The quadrangular piece of bone having been detached and turned upward, symphysiotomy is performed according to the ordinary method by dividing the lower half of the symphysis pubis. The wound is then plugged with iodoform-gauze. After delivery the rectangular bony segment formed by the upper half of the symphysis pubis is made to slide in between the articular surfaces of the lower half of the pubic bones previously deprived of their fibrocartilaginous lining. To ensure stability, the displaced segment is wired in its new position and fixed to the remainder of the pubic bones on either side with steel pegs. It is possible, however, that silk or catgut may answer the purpose. [While ingenious, these procedures would considerably lengthen

the time of the operation and materially increase the risks of sepsis, shock, and permanent disability subsequent to the operation.]

Accidents.—Lacerations of the maternal soft parts—the urethra, bladder, and vagina—are not uncommon, and most frequently occur in primiparæ. Rupture and separation of the sacroiliac joints have also been noted. All of these accidents may, according to Garrigues,¹ be avoided by extracting the child slowly and in the proper direction; by avoiding pressure in front; if necessary, by performing episiotomy; by keeping the protruding vagina and bladder back during the approximation of the bones; and by not passing the proper limits of the indications.

Audebert² collects 20 cases of laceration of the vagina following symphysiotomy, 12 cases in which the vagina and urethra were injured, and 6 cases in which the bladder sustained damage, to which he adds a case operated upon by himself. He introduced sutures in his own case, and his patient made a good recovery. [The study of these cases, taken from the records of the most experienced operators in symphysiotomy, impresses one with the fact that, under some circumstances, such injury can with difficulty be avoided.] Audebert advises that after the joint is opened the two halves of the bone be held in a fixed position by an instrument which he describes and illustrates. He would also separate the soft parts beneath the symphysis completely, cutting the subpubic ligaments. If the vulva and vagina are small, dilatation with a rubber bag is advised. When the forceps is used the instrument should be applied at the superior strait if possible, traction being made downward and backward. The head should be extracted, turned obliquely, and even transversely with the long axis of the vulva. Should injury to the anterior vaginal wall and the urinary tract seem imminent, it is better to incise the peritoneum freely, and close such separation of tissue by sutures after delivery.

Results.—Morisani³ states that the pretended disastrous results of symphysiotomy have been observed only when the operation was not performed within the limits of its indications, the causes being (*a*) the time of labor when it was performed; (*b*) the manner of operating; (*c*) the lesions already inflicted on the genital tract; (*d*) the special conditions of the patients. The death of the fetus is to be attributed to (*a*) a too late intervention; (*b*) accidental circumstances; (*c*) the accessory means serving to extract the child. Garrigues⁴ remarks that it cannot be denied that a certain number of women develop a waddling gait. That this is not so very rare will appear from the fact that in two operations he has had one such case, Grandin one in four operations, Zweifel three in twenty-three operations, and Fritsch four in four operations.⁵ This gait, however, does not interfere with perfect health and strength. Spinelli at the International Congress at Rome stated that from the earliest history of symphysiotomy, cases have been noted that subsequently passed through a normal parturition, and this fact

¹ Med. Rec., Nov. 10, 1894.

² Loc. cit.

⁴ Loc. cit.

³ Archives de Tocologie, Nos. 2 and 3, 1895.

⁵ Centralbl. f. Gynäk., 1894, pp. 347, 460.

was used by the adversaries of the operation as an argument against it. In his own practice he has had one such patient who had undergone symphysiotomy eight years previously. Mancusi has likewise had such an experience. Spinelli is of the opinion that in women who have already undergone symphysiotomy the delivery should be left to nature if the pubic bones show mobility and there is relaxation of the intrapubic ligaments.

Pinaud¹ reports the case of a woman upon whom symphysiotomy was performed in 1893. She suffered from suppuration and necrosis of the pubis, which left her with a movable pubic joint. As the patient desired an operation, the two halves of the pubis were thoroughly curetted with Volkmann's curet, and adhesions between the two bones were separated with a bistoury, when it was found that by vigorous pressure upon the sides of the pelvis the two surfaces could be brought into good apposition. There was considerable hemorrhage, which was checked by an antiseptic tampon. The periosteum and fibrous tissue were detached from the anterior surface of the pubic bones for 5 or 6 mm.; the bones were then perforated with a fine trephine, and while pressure brought the two surfaces together they were wired in that position with silver wire. The ends of the silver wire were invaginated, and the surrounding tissues stitched over them with catgut. The skin was closed with silk, and a small drain placed at the lower extremity of the wound. A dressing of iodoform-gauze and cotton was then applied. The hips were tightly bandaged, and a catheter was placed in the bladder. The result was excellent, the patient being able to walk without fatigue.

Von Woerz² reports 10 symphysiotomies performed some time previously, most of the patients being still available for observation. Of the 10 patients, 1 died of sepsis after the operation; 6 are in good condition, abundantly able to work without inconvenience; 1 could not be followed after leaving hospital care; 1 cannot stoop to work on her hands and knees without pain in the sacroiliac joints; 1 suffered from incontinence of urine, which was cured by taking cold baths. Braun³ reports 8 symphysiotomies, and of these none died; 6 are now in good condition, working without inconvenience; 1 suffers from incontinence of urine and sacroiliac pain on heavy lifting; 1 has incontinence of urine on straining and lifting. In Von Woerz's cases 5 were treated by drilling the symphysis and wiring with silver wire; in 4 the wire suture could not be successfully applied, and 1 had no suture. While good union is possible without suture, yet suture is preferable. Braun treated his cases, with drilling and wiring, 3; with suture of the periosteum, 4; and without suture, 1. There seemed to be no difference in the result in these cases. [In view of the excellent results obtained without drilling and wiring the symphysis, the procedure is unnecessary.]

[Symphysiotomy may, we think, be looked upon now as an established operation. It is probable that by a larger experience and by securing the patients in good season the mortality both in women and children will be

¹ *Mercredi médical*, No. 14, 1895.

² *Centralbl. f. Gynäk.*, Nos. 36 and 37, 1894.

³ *Ibid.*

reduced. In all doubtful cases of minimum pelvic measure, however, it is safer to deliver under Cesarean section, performed early, and, better still, before labor has commenced.]

Cesarean Section.—Cases have been reported during the year as follows: Charles,¹ 3 successful cases; Hirst,² 2 cases, successful for the mother, but both children dead; Hough,³ 1 successful case; Cullingsworth,⁴ 1 fatal case; Salvetti,⁵ 1 successful case, the patient being rachitic and not quite four feet in height; Thorne,⁶ 1 successful case; Crostin and Clarke,⁷ 1 successful case performed to remove a double monster; and Franklin,⁸ an interesting case of intrauterine and extrauterine fetations at full term in which a Porro operation was performed.

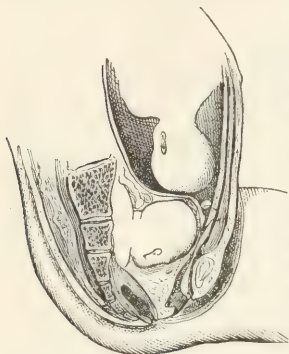


FIG. 8.—Combined intrauterine and extrauterine gestation (Brit. Med. Jour., May 12, 1894).

A living male child was extracted from the uterus, and a dead, full-term fetus was removed from an extrauterine gestation-sac situated deeply in the pelvis and supposed to be a sarcomatous growth. Profuse hemorrhage followed, and the patient died within thirty minutes. Haven⁹ reports 1 successful case; he has also collected 40 cases operated upon in the United States since 1888, and of these 9 died, giving a mortality of $22\frac{1}{2}$ per cent. Of the 9 deaths, 1 case was operated upon without any antiseptic precautions; 1 had been in labor six days, and had had forceps and version tried; another had advanced malignant disease and was dying at the time of operation; still another had been in labor two days, and had had forceps and version tried. This is true of a fifth, and the sixth death was in a case in which labor had lasted five days and in which the woman was septic. These cases should not properly be counted; if omitted there are but 3 deaths in 34 cases, or a death-rate of between 8 and 9 per cent. The table is appended (pp. 410, 411). Bäcker¹⁰ performed a postmortem Cesarean section and delivered a living child. Maternal death, which occurred in the last month of pregnancy, was due to chronic cardiac and pulmonary disease. The child was removed immediately after the death of the mother; it was asphyxiated, but was resuscitated by Schultze's method, being swung 56 times before it began to breathe. Bäcker reports, also, a former case in

¹ Inter. Med. Mag., June 18, 1894.

³ Quart. Med. Jour., April, 1895.

⁵ Gaz. med. di Torino, Jan., 1894.

⁷ Edin. Med. Jour., May, 1894.

⁹ Boston Med. and Surg. Jour., Feb. 21, 1895.

¹⁰ Centralbl. f. Gynäk., No. 24, June 16, 1894.

² Univ. Med. Mag., vol. vi., No. 5.

⁴ Lancet, June 16, 1894.

⁶ Pacific Med. Jour., Aug., 1894.

⁸ Brit. Med. Jour., May 12, 1894.

which the child, in a condition of asphyxia livida, was swung 733 times by actual count, when the heart ceased to beat.

Indications.—The exact dividing-line between the absolute indication for Cesarean section and that for symphysiotomy is in many instances not positively defined. Hirst,¹ however, is confident that the time will come when error can be avoided, but this can only be brought about by a collective experience and a wide interchange of views among those to whom this problem is frequently presented. Dolder² contributes a monograph entitled "The Position of the Country Physician in respect to Perforation and Cesarean Section," in which he [rightly] insists that the latter operation is unjustifiable in the hands of the country doctor, notwithstanding the superior education and ability of the present generation of country doctors and the spread of antiseptics. The uncertain and inconvenient surroundings and the lack of clinical experience renders the mortality of the section alarmingly high, over 50 per cent., although the theoretic knowledge may be good. [When this is compared with the mortality of the Porro Cesarean section in the hands of skilled abdominal surgeons, about 20 or 25 per cent., as announced by Harris,³ the conclusions to be drawn are obvious.]

Technique.—As regards technique, Charles⁴ claims that the best results follow the making of an incision over the fundus and superior portion of the uterus, and in order to attain this the middle of the incision should correspond to the umbilicus. [This practically coincides with the incision in vogue among all obstetric surgeons.]

Repeated Cesarean Section.—Instances of women upon whom the Cesarean operation had been twice performed have been reported by Coe⁵ and Guéniot,⁶ two cases being reported by each with successful terminations as regards both mothers and children. These, when added to the 36 cases tabulated by Dr. Julius Rosenberg,⁷ give a total of 40 cases in medical literature.

Forceps.—[The abuse of the forceps and the ill results following have long elicited vigorous protests against this variety of meddlesome midwifery. While it is true that too often the forceps is used merely for the convenience of the physician, we feel that the day is now past when a woman may be permitted to linger through hours of torture merely because exhausted nature cannot rally sufficient power to expel the fetus, and the indolent or timid obstetrician refuses to supplement the *vis à tergo* by judicious traction from without.] Aron⁸ reports 216 labors in which the forceps was used 156 times, and turning undertaken 15 times, without any accident, thanks to antiseptic precautions. He asserts that involution is more perfect and puerperal fever less to be feared after instrumental and artificial than after pro-

¹ Ann. of Gyn. and Ped., June, 1894.

² Volkmann's Sammlung klin. Vorträge, No. 99, May, 1894.

³ Lancet, May 19, 1894.

⁴ N. Y. Polyclinic, Aug. 15, 1894.

⁵ Am. Jour. Obst., vol. xxiv., No. 10, 1891.

⁶ Loc. cit.

⁷ L'Union méd., July 5, 1894.

⁸ Progrès med., Sept. 1, 1894.

CESAREAN SECTION IN THE

Case.	Operator.	No. Preg.	Previous Operations.	Age.	Labor.	Conjugate. Inches.
1	W. H. Lusk.	.....	.....	..	In labor.	..
2	W. H. Lusk.	.....	.....	..	In labor.	..
3	W. H. Lusk.	.....	.....	..	6½ days.	2½
4	W. H. Lusk.	.....	.....	26	.....	..
5	J. S. Hawley.	Sixth.	.....	32	.....	..
6	J. E. Allen.	Several misc.	Tried forceps and version before Cesarean operation.	35	6 days. Exhausted.	2½
7	J. M. Hays.	Fourth.	Craniotomy.	..	.....	..
8	H. H. Vinke.	.....	Tried forceps and version before Cesarean operation.	20	2 days.	..
9	Seth Hill.	.....	Ditto.	21	2 days.	..
10	D. H. Fay.	.....	.....	..	36 hours. Exhausted.	1½
11	H. A. Kelly.	First.	.....	26	2 weeks. Exhausted.	2½
12	F. M. Donohue.	First.	.....	30	3 days.	..
13	H. A. Kelly.	Fourth.	2 craniotomies. 1 misc.	..	Not in labor.	..
14	H. A. Kelly.	.....	.....	..	.....	2½
15	H. A. Kelly.	Third.	Forceps.	26	.....	2½+
16	D. Logaker.	Twelfth.	.....	40	30 hours.	..
17	A. H. F. Biggar.	Fourth.	3 craniotomies.	28	.....	..
18	A. H. F. Biggar.	Third.	.....	34	5 days. Septic.	..
19	R. A. Murray.	Second.	.....	25	3 days. Exhausted.	3½
20	H. C. Coe.	First.	.....	..	.....	3½
21	H. C. Coe.	Second.	.....	37	.....	..
22	Henry Gibbons.	.....	.....	..	24 hours.	2¼
23	J. N. Bartholomew.	Second.	.....	17	.....	2
24	H. A. Kelly.	.....	2 craniotomies.	..	.....	3
25	H. A. Kelly.	.....	.....	36	.....	3
26	H. C. Coe.	.....	.....	22	.....	3½
27	H. C. Wyman.	First.	.....	..	.....	..
28	Seth Hill.	.....	.....	..	1 week.	..
29	J. H. Carstens.	First.	.....	24	.....	3
30	P. H. Ingalls.	Second.	.....	33	24 hours. Exhausted.	2½
31	William Goodell.	Twelfth.	.....	32	.....	..
32	C. Kellock.	.....	.....	..	.....	..
33	T. G. Thomas.	First.	.....	20	Second stage.	2½
34	A. H. F. Biggar.	Fifth.	3 craniotomies.	29	.....	..
35	A. H. F. Biggar.	Sixth.	3 craniotomies.	34	Same patient as No. 34.	..
36	G. S. Mitchell.	First.	.....	24	2 days. Exhausted.	1½
37	M. L. Wescheke.	.....	.....	36	Several days.	..
38	A. Worcester.	.....	1 craniotomy, 1 version at 8 months.	..	34 hours.	4½
39	A. P. Dudley.	Third.	2 craniotomies.	..	.....	2¾
40	George Haven.	Third.	1 craniotomy, 1 version. Forceps.	35	Not in labor.	2¾

UNITED STATES SINCE 1888 (HAVEN).

Cause of Operation.	Uterus.	Antiseptic.	Mother.	Child.	Where.	Reference.
Probable deformity.	.....	HgCl ₂	Well.	Well.	Hospital.	Trans. Gyn., 1888.
Carcinoma of uterus.	.....	"	"	"	"	Ibid.
.....	Outside.	"	"	Dead.	"	Ibid.
Gen. cont. pelvis.	"	"	Dead.	"	"	Med. Jour., New York, 1889.
Carcinoma of vagina.	.....	"	Dead (nearly so when op.).	"	"	Ibid.
.....	Outside.	Carbolic.	Dead.	"	Home.	Am. Jour. of Ob., New York, 1889.
Flat pelvis.	"	HgCl ₂	"	"	"	N. C. Med. Jour., 1889.
.....	"	"	"	Well.	"	Med. Assoc. Mo., 1889.
Gen. cont. pelvis.	.....	"	"	"	"	Ibid.
Gen. cont. pelvis.	Outside.	"	Well.	"	"	Trans. Gyn., 1890.
.....	Inside.	"	"	"	"	Am. Jour. of Ob., New York, 1890.
Fibroid.	"	"	"	Dead.	"	Ibid.
Rachitic fibroid tumor.	"	"	"	Well.	Hospital.	Ibid.
.....	"	"	"	"	"	Ibid.
Flat pelvis.	"	"	"	"	"	Ibid.
Tumor.	.....	"	"	"	Home.	Med. and Surg. Rep. 1890.
Rachitic pelvis.	.....	"	"	"	Hospital.	Med. Rec., New York, 1890.
.....	.....	"	Dead.	Dead.	Home.	Ibid.
Impacted shoulder, gen. cont. pelvis.	.....	HgCl ₂	Well.	Well.	Hospital.	Med. Jour., New York, 1890.
Rachitic.	Outside.	"	"	"	"	Trans. Gyn., 1891.
Fibroid.	"	"	"	"	"	Ibid.
.....	.....	"	"	"	Home.	Occident. Med. Times., 1891.
Rachitic pelvis, gen. cont. pelvis.	Inside.	Carbol., 5%.	"	"	"	Med. Jour., New York, 1891.
.....	"	HgCl ₂	"	"	Hospital.	Ibid.
Rachitic pelvis.	"	"	"	"	"	Johns Hop. Bull., 1891.
Gen. cont. pelvis, result of accid't.	Outside.	"	"	"	"	Internat. J. S., New York, 1891.
Deformed pelvis.	.....	"	Dead.	Dead.	Home.	Med. Rec., New York, 1891.
Gen. cont. pelvis.	.....	"	Well.	Well.	"	Proceedings Can. Med. Soc., 1891.
.....	Outside.	"	"	"	Hospital.	Am. Jour. of Ob., New York, 1892.
Gen. cont. pelvis.	.....	"	"	"	"	Ibid.
Carcinoma of uterus.	Inside.	"	"	"	"	Med. Press, New York, 1892.
Flat pelvis, dwarf.	.....	"	"	"	Home.	N. C. Med. Jour., 1892.
Gen. cont. pelvis.	.....	"	"	"	Hospital.	Med. Rec., New York, 1892.
" " "	.....	"	"	"	"	Ibid.
" " "	.....	"	"	"	"	Ibid.
Tumor.	Outside.	"	"	"	Home.	Am. Jour. of Ob., New York, 1893.
Deformed. Emergency.	.....	Soap.	Dead.	Dead.	"	Pacific Med. Journal, San Francisco, 1893.
Gen. cont. pelvis.	Inside.	HgCl ₂	Well.	Well.	Hospital.	Boston Med. and Surg. Jour., 1893.
" " "	.....	"	"	"	"	Post Grad., New York, 1893.
" " "	Outside.	"	"	"	"	

tracted spontaneous delivery. Charpentier strongly combats this theory, and insists that the application of the forceps only an hour and a half after complete dilatation, and turning commenced when the cervix is still retracted, are hasty, meddlesome proceedings. [Aron's stand would seem to be proper and humane.] Guensbourgue¹ in 95 cases of forceps delivery had no maternal mortality and but 2 per cent. fetal mortality directly due to the use of the instrument; 72.6 per cent. of the cases were afebrile in the puerperium. Cocq² presents the results of a series of investigations relative to the compression exercised by the forceps on the fetal head in pelvic contraction. He states that in pelves regularly or generally contracted the application of the forceps becomes a disguised embryotomy if the transverse diameter of the superior strait or of the cavity be less than 11.5 centimeters. In these conditions version or symphysiotomy according to indications should be preferred to the forceps. If the pelvis be flattened only, it is equally necessary to be very circumspect when one applies the forceps in cases in which the true conjugate is less than 9 centimeters. The forceps placed in the transverse diameter of the pelvis and the occipitofrontal diameter of the child will shorten the latter and augment the biparietal, and although the biparietal

measures 9.5 centimeters at term, it ought to engage when the true conjugate has a diameter of 9 centimeters; it will only be able, however, to accomplish this by lessening considerably. The fetal head will diminish in various directions, but not without some dangers, and it is not well to assist too much with the forceps when very firm resistance to the passage of the head is experienced. It is in these cases that version or symphysiotomy offers great advantages.

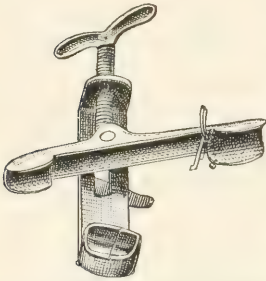


FIG. 9.—Hamilton's clamp for obstetric forceps (Ann. of Gyn. and Ped., Nov., 1894).

In order to prevent slipping of the blades, and to relieve the operator from exercising the force necessary to firmly compress the handles of the obstetric forceps, Hamilton³ has devised a clamp (see illustration, Fig. 9) that can be accommodated to any forceps. It weighs but 45 grams and measures 85 by 30 centimeters.

PATHOLOGY OF THE PUERPERIUM.

Puerperal Sepsis.—[Much has been written upon the etiology of this dread disease in the effort to ascertain why it is that, notwithstanding the thorough asepsis and antisepsis of the obstetric practice of the day, there is not noted a further decrease in the death-rate. Indeed, following in the line of the investigations of Döderlein and others, and of the sugges-

¹ Archiv. de Tocol. et de Gynéc., No. 3, 1894.

² Ibid., No. 5, 1894.

³ Ann. of Gyn. and Ped., Nov., 1894.

tion of Leopold and Spörlin, there has been somewhat of a reaction against the frequent and indiscriminate examination and douching of the vaginal tract, in the belief that such manipulations, when carried to excess, are conducive rather to the development of septic infection.] Schröder¹ holds [and his position is a true one] that the poison of puerperal endometritis is often actually diffused throughout the body by intrauterine irrigation, thus converting a comparatively harmless local affection into a serious and often fatal condition. Vaginal injections, while safer, he believes also frequently cause a general infection. Glockner's statistics are also not favorable to prophylactic vaginal irrigation. Leopold's results show that skilful antiseptic vaginal douching is not only useless, but actually dangerous; hence Wright² claims that indiscriminate douching by good, bad, or indifferent nurses is dangerous in a still greater degree.

The bacteriologic study of the vaginal secretions in parturient women is still commanding a considerable amount of attention. Döderlein, Winter, Steffek, and others have found pathogenic micrococci, particularly the staphylococcus albus and aureus and other pus-producing microbes, in the vaginal secretions of women after labor. On the other hand, Krönig³ has found in the lochia the streptococcus most frequently, and but seldom the staphylococcus aureus, and never the staphylococcus albus. After considering minutely the reaction of the vaginal secretion, which in three hundred pregnant women he found to be distinctly acid, he concludes that in pathologic conditions the secretions attain a much higher degree of acidity, so that the streptococcus pyogenes can hardly thrive therein; at least he was unable to obtain cultures of this germ. He further concludes that the vagina of every untouched pregnant woman is aseptic, containing nothing pathogenic, the thrush or gonococcus germ excepted; hence he regards vaginal injections as dangerous, since they may chemically lessen the resistance of the tissues to bacteria, and may increase the intensity of septic endometritis by washing bacteria into the uterine cavity. Williams⁴ claims that puerperal sepsis is due to a number of microorganisms, the most frequent causal organism being the streptococcus pyogenes. Cases infected with staphylococcus aureus are comparatively rare and usually of moderate severity. He knows of no fatal case following infection with the gonococcus. Chase⁵ gives the order of frequency and virulence of the specific microorganism of puerperal sepsis as follows: 1. Streptococcus pyogenes, which is Fehleisen's diplococcus of erysipelas; 2. Staphylococcus pyogenes aureus, found in ordinary pus; 3. Staphylococcus pyogenes albus; 4. Staphylococcus pyogenes citreus; 5. Possibly bacillus pyocyaneus and other bacilli. Doléris⁶ says that the chief habitat of the streptococcus is the surface about the point of the placental

¹ Sammlung klinischer Vorträge, April, 1894.

³ Deutsch. med. Woch., October 25, 1894.

⁵ Brooklyn Med. Jour., December, 1894.

⁶ Nouv. Archiv. d'Obst. et de Gyn., No. 3, 1894.

² Canad. Prac., Dec., 1894.

⁴ Am. Gyn. and Obst. Jour., Jan., 1895.

attachment, the clots that may have formed in the orifice of the sinuses, and any discharges that may be in the uterine cavity. The vitality of the streptococcus is uncertain; it may lie dormant in the tissues for years. Its pathogenic action may be: 1. Hypertoxic by its toxin, and limited to the first stage of the inflammation; 2. Destruction of vitality, and a cause of necrobiosis *en masse* of the tissues; 3. Pyogenic or septic at the same time. Ahlfeld¹ and Jewett² both believe the seat of most active absorption of the toxic material to be the placental site of the uterine mucosa, and next the vagina.

Döderlein³ points out the difference between the normal and pathologic vaginal secretion as follows: The normal secretion is a whitish material, with the consistency of clotted milk and acid in reaction; it contains a long bacillus, a few epithelial cells, and sometimes a few yeast-cells. The pathologic secretion usually has a yellowish or yellowish-green color, is of creamy consistency, and often contains gas-bubbles and tough mucus; the reaction is sometimes faintly acid, frequently neutral or alkaline; it contains bacilli and cocci, leukocytes, and epithelial cells.

[The question of autoinfection has been thoroughly ventilated. It would appear from the bacteriologic investigations thus far recorded that such a method of development of puerperal sepsis is quite possible in a certain proportion of cases, but that its occurrence is comparatively rare.] Barnes, in a recent paper before the British Medical Association, prefers for this condition the name of *endogenous infection*. Henrotay⁴ regards autoinfection as rare and of secondary importance, while Herman⁵ goes further, and says that there is no such thing as self-infection with puerperal fever, and that the causes supposed to produce "autogenous" puerperal fever in lying-in women defended by antiseptics from septic poison produce only trivial illnesses. Errors of diet, malaria, chills, bad hygienic surroundings, emotion, strumous diathesis, and the effects of sewer-gas may give rise to symptoms simulating puerperal sepsis, and these must be excluded. The poison of erysipelas of the skin, he says, produces in puerperal women erysipelas of the skin, and no other illness, and the poison of scarlet fever produces in them scarlet fever only, but the poison of the disease known as phlegmonous erysipelas of cellular tissue produces puerperal sepsis.

Pathology.—Excluding those rare cases of so-called autoinfection, the septic matter of true puerperal sepsis enters the system by three channels—by the veins, the lymphatics, or more directly by extension along the continuous mucous tracts. Says Murray:⁶ "As a marked example of the effects of venous infection we have puerperal septicemia or putrid infection (*septicemia acutissima*—Garrigues), the course of which is extremely rapid

¹ Zeitsch. f. Geb. u. Gyn., Band xxvii. Heft 2.

² Am. Medico-Surg. Bull., Aug. 15, 1894.

³ Archiv. de Toccol. et de Gynéc., June, 1894.

⁴ Public Health, vol. vi., No. 9, June, 1894.

⁵ Am. Medico-Surg. Bull., May 1, 1894.

⁶ Ann. of Gyn. and Ped., July, 1894.

and fatal; in a milder form the septicemia produced by pieces of retained decaying placenta (*sapremia, resorptive fever*), which is often dissipated by their removal and cleansing of the uterus. We have also the same cause in thrombosis of the uterine, iliac, or femoral veins, giving rise to phlegmasia alba dolens, and, when the thrombus infected by sepsis becomes an embolus of the pulmonary artery, producing infarctions of the lung, endocarditis, and, when affecting the joints, leading to arthritis of a suppurative form with pyemia. In the lymphatic form we have often found diphtheric patches at the vulva, vagina, or in the uterus, commencing in the laceration of these structures during labor, absorption of the septic matter, which is conveyed to the broad ligament, and from thence to the tube, ovary, and peritoneum, giving rise to parametritis, perimetritis, ovaritis, and peritonitis. When the poison directly extends through the genital tract we have endokolpitis, endometritis, metritis, pyosalpinx, peritonitis. It may commence, as frequently it does, in the uterus by an endometritis, which extends the same as when started in the vagina."

Kehrer's¹ classification of puerperal sepsis is as follows: 1. Sapremia (*resorptive fever*), a febrile condition caused by the resorption of putrid masses from the cavum uteri; 2. Puerperal peritonitis; 3. Puerperal pyemia, thrombophlebitis, septicopyemia; 4. Septicemia.

Among the rarer pathologic manifestations of puerperal sepsis may be noted scarlatiniform erythema, cases of which are reported by Gaertig² and Lœvot;³ paralysis of the bladder, one case occurring in the hands of Goudard;⁴ puerperal tetanus, one case of which is reported by Maxwell;⁵ and puerperal neuritis, one case reported by Lountz.⁶

Treatment.—In regard to the prophylaxis of this disease, Murray⁷ formulates the indications briefly as follows: Antisepsis before confinement, antisepsis after confinement, and the employment of means to promote uterine contraction. An intrauterine douche should be given only after the hand has been introduced into the uterus, when there has occurred maceration of the placenta or child, or when there is hemorrhage. He favors the administration of dram or half-dram doses of ergot after labor to secure uterine contraction, and follows micturition by a weak solution of an antiseptic lotion to the genitals. As antiseptic agents for vaginal douching Chase⁸ prefers a 2½ or 3 per cent. solution of phenol or a solution of hydrogen dioxide. Currie⁹ objects to creolin on account of its color. He remarks that the use of eucalin (one of the coal-tar products combined with eucalyptus) in the proportion of 1 to 100 of water is not objectionable on account of its color. For vaginal douching, however, he prefers a 1 or 1½ per cent. solution of lysol.

¹ Canad. Pract., Nov., 1894.

² Centralbl. f. Gynäk., No. 30, 1894.

³ Jour. de Méd. de Paris, June 24, 1894.

⁴ Ibid., Dec. 9, 1894.

⁵ Jour. Am. Med. Assoc., Aug. 11, 1894.

⁶ Nouv. Arch. d'Obst. et de Gyn., No. 9, 1894.

⁷ Loc. cit.

⁸ Loc. cit.

⁹ Boston Med. and Surg. Jour., June 20, 1895.

For the disease itself Chase would reduce the fever by means of the abdominal coil, at the same time administering alcoholic stimulants freely, together with heart-tonics, such as strychnin; saline cathartics are needed early, and, locally, perfect drainage, thorough irrigation of the parturient canal, with curetment, and the protection of lacerations and abrasions by phenol and iodine. Tarnier¹ in simple sapremia would precede curetment by *écouvillonnage*, or the scrubbing out of the interior of the uterus with a brush similar to those used for cleansing bottles or test-tubes. This failing, the curet must be used. Madden² uses three drugs, quinin, sulphurous acid, and turpentine. Sulphurous acid he uses in half-dram doses every third hour as a powerful oxygenating and germicidal agent; it is especially useful in cases with marked gastrointestinal symptoms. Turpentine in from 10- to 20-drop doses is of service in all cases in which the stomach will tolerate its use. Bonnaire³ combats the offensive diarrhea that is usually present by some form of intestinal antiseptic, such as benzonaphthol, naphthol, salol, or bismuth salicylate; he increases diuresis by a milk diet, and excites the skin to increased action by frictions or baths. Calomel he administers internally to act directly upon the germs and their products in the blood; he gives the first day seven grains at a dose, and repeats four hours afterward, following the next day with small doses ($\frac{3}{4}$ grain) every two hours. In the line of rendering the blood more resistant to microbic influence the subcutaneous injection of the serum of Hayem, in two injections daily of 10 fluidrams each, will often produce the greatest tonic influence. The formula for this serum is as follows: Sodium chlorid, 5iiss; sodium sulphate, 5iiss; water, Oij. Macé⁴ has treated three cases of puerperal sepsis with cold baths. He says the cold may be applied in two ways: Iced compresses may be placed upon the patient's body, combined or not with the use of a water-mattress, which cools the posterior portion of the body; or the body may be surrounded by a rubber tube through which cold water is running. The contraindications to the baths are peritoneal involvement, abscess of the broad-ligament, and profound collapse. They cannot be used in phlegmasia alba dolens. [In suitable cases this form of treatment is beneficial and very grateful to the patient.] Rose⁵ recommends the following local treatment for puerperal sepsis: A bivalve speculum is introduced, and the whole uterine cavity wiped out with borated cotton in the grasp of a Bozeman's long dressing-forceps. The interior of the uterus is then daubed over with cotton saturated with iodized phenol. A marked improvement follows within a few hours. The treatment is repeated daily as required. Cullingworth⁶ does not rely upon the intrauterine douche only to disinfect the uterus, but by means of the fingers he separates any piece of adherent placenta or membranes that may be present, and completely empties the uterus. He then uses a mercuric-bichlorid douche, carefully compressing the uterus afterward to remove the

¹ Jour. de Méd. de Paris, Jan. 6, 1895.

² Dublin Jour. of Med. Sci., June 1, 1894.

³ La Trib. méd., July, 1894.

⁴ Jour. de Méd. de Paris, Feb. 2, 1895.

⁵ N. Y. Med. Jour., Feb. 16, 1895.

⁶ Practitioner, April, 1895.

solution from its cavity and from the vagina. Huinrik¹ reports 52 cases of puerperal sepsis in the Amsterdam Obstetric Clinic treated by prolonged irrigation with 1 and $1\frac{1}{2}$ per cent. or 2 per cent. phenol solution, or 1:4000 mercuric-bichlorid solution; following this irrigation the inner surface of the uterus was thoroughly painted with undiluted tincture of iodine. All of the cases recovered, the treatment being instituted as soon as fever developed.

Hardon² believes that many cases of puerperal peritonitis, if seen within from twenty-four to forty-eight hours after development, can be aborted by free active purgation by magnesium sulphate. In advanced cases opium must be administered, and if the disease becomes general the continued use of the salt is advisable. [Here arises the very interesting and important question of operative interference in septic peritonitis, which, entering as it does into the realm of abdominal surgery, has appropriately been considered in the department of Gynecology.]

In those cases of puerperal sepsis in which a pelvic exudate has been thrown out, Birnbaum³ remarks that even after there has occurred pus-formation it is still possible to have absorption by the use of compresses. If continued high fever persists, drainage of the collection is required. When fluctuation is detected, an incision is made from one to two centimeters above Poupart's ligament and from two to three centimeters from the anterior superior iliac spine. When fluctuation is not positive exploratory puncture is recommended. From the rectal region it is more difficult to remove the collection, but exploratory puncture may also be tried through the vagina, and drainage employed. When the abscess breaks into the rectum or bladder without sufficient drainage, Byford recommends inserting a sound through the abscess-opening, turning the point against the vaginal wall, and cutting against the point of the sound.

The use of the curet in puerperal sepsis more than holds its own. Ferré,⁴ who long tried uterine irrigation, now strongly advocates the surgical procedure, only, however, when placental remains require removal. Pryor has gone so far as to say that should the inventor of the curet be found out, he should be immortalized. Even in those cases in which an elevation of temperature shortly followed curetment of the cavum uteri, Rachel⁵ [very improperly, we think] advocates repeated curettage. Such cases are probably metritic in nature, and, if so, hysterectomy would be the proper course to pursue. [The perplexing subject of hysterectomy for puerperal infection has been considered in the article on Gynecology, to which the reader is referred.]

Postpartum Hemorrhage.—Schauta⁶ compares his method of controlling postpartum hemorrhage with the methods of Credé and Ahlfeld. Ahlfeld suggests the expectant plan of treatment, in which he advises no excitement of the uterus within two hours, till the uterus would naturally contract

¹ Nederl. tijdschr. v. Verlosk en Gynecol., Jahrg. v. Abl. 2.

² Atlanta Med. and Surg. Jour., Oct., 1894.

³ Der Frauenarzt, July 7, 1894.

⁴ Nouv. Arch. d'Obst. et de Gyn., Nov. 25, 1894.

⁵ Pacific Med. Jour., Sept., 1894.

⁶ Med. Press and Circ., May 8, 1895.

on the placenta and expel it. Schauta in practice usually follows a modification of these two methods. If the placenta separates rapidly and the uterus contracts immediately after in the normal condition, there is little need of interference; but in cases in which these favorable conditions do not supervene, in which the uterus lies dormant and the placenta remains fast, he pursues gentle rubbing with slight pressure over the uterine region, but never ventures to expel the placenta within the first half-hour after birth unless pains are present. He finds that Credé's method would in 100 cases give a loss of blood during the first stage of 255 grams, and during the first three hours of the puerperium of 319 grams, a total of 1312 grams; Ahlfeld's method, 473 grams in the third stage, and 154 grams in the three hours of the puerperium, or a total of 950 grams; while his method loses 333 grams in the third stage and 182 grams in the three hours of the puerperium, or in all 879 grams.

Hematoma Vulvæ.—Goldberg¹ states that according to Winckel's statistics this serious complication occurs only once in 1600 labors. Cases are reported by him and by Chevaleff.²

Puerperal Osteomalacia.—Löhlein³ supports the teachings of Kehrer regarding the parasitic origin of puerperal osteomalacia, and inclines to the opinion that the disease may originate through the operations of the bacteria of bone-pus. Fehling, however, states that he has failed to find microorganisms in the blood and ovaries of osteomalacic patients. Löhlein reports a clinical case of a woman in her fourth pregnancy who had suffered relapses of the disease after each gestation. A piece of bone removed from the right iliac crest during a Porro operation showed under staining the presence of microorganisms. [Before the bacteric origin of this disease can be accepted in these days, when almost every disease is being attributed to the action of microorganisms, more substantial confirmation must be afforded.]

Embolism of the Pulmonary Artery.—Spörlin⁴ has collected from the literature 33 cases of embolism of the pulmonary artery occurring during labor or the puerperium; 26 of these patients died. Spörlin adds 2 cases observed by himself, of which 1 died and the other had a slow recovery. In 26 of the cases the origin of the emboli must have been in the pelvic veins. The formation of thrombi in the course of the saphenous vein, or of dilatation-thrombi in the varices of the leg, plays an important rôle in the etiology of pulmonary emboli. Phlegmasia alba dolens is to be regarded as the first symptom of a threatening embolus of the lung, and is to be treated by elevation and rest of the leg.

Changes in the Colostrum and Milk of Nursing Women induced by Disease.—As the outcome of an analytic study in a moderate number and range of cases, Ludwig⁵ has found that the amount of fat contained in

¹ Centralbl. f. Gynäk., No. 30, 1894.

² Répert. Univ. d'Obst. et de Gyn., July 25, 1894.

³ Centralbl. f. Gynäk., No. 1, 1894.

⁴ Zeitschr. f. Geburt. u. Gynäk., Bd. xxvii.

⁵ Archiv für Gynäkol., B. xlv. H. 2, p. 343.

the milk of nursing women is considerably increased in cases of tuberculosis (when any secretion of milk takes place at all), while the remaining constituents undergo no noteworthy change. In case of albuminuria, particularly if the amount of albumin lost is large, and also if the amount of albumin is small if the nutrition is also impaired, the amount of proteids in the lacteal secretion is notably diminished and the amount of sugar is slightly diminished. In case of profound anemia following hemorrhage in the course of labor the lacteal secretion is deficient in solids, in fats, and in sugar. In case of marked pyrexia the amount of solids and of fats falls, while the amount of proteids and sugar is variable. The milk of syphilitic nursing women was found to be poor in solids, in fats, and in sugar, while the amount of proteids was variable.

Fissured Nipples.—Tucker¹ has abandoned with benefit the practice of using astringents during pregnancy. He also limits manipulation of the nipple to those cases in which the nipple is imperfectly developed—the slightly inverted or flat, or protruding with a depression on top (“crater nipple”). As a prophylactic measure Lepage² strongly recommends that the nipples should be regularly washed with the following solution: Mercuric iodid, from 10 to 20 centigrams (2 to 4 grains); spirit of wine, 50 grams (1½ ounces); glycerol and distilled water, each 1 pint. If after using this for a few days the ulceration disappears, a solution of boric acid may be substituted. Aristol is also highly recommended by Vinay in an ointment containing 1 dram to 5 of vaselin. Joise³ has observed that cocain, when applied to cracked nipples, has the power of diminishing the milk-secretion, and from this fact he was led to the use of this agent when he desired a complete suppression of milk. He applies a 5 per cent. solution in equal parts of glycerin and water five or six times daily to the nipples. Suppression of milk is observed in from two to six days. By producing anesthesia of the nipple cocain prevents its erection, and thus favors the decrease in the quantity of milk.

PHYSIOLOGY AND PATHOLOGY OF THE NEW-BORN.

Anatomy and Physiology of the Circulation in the New-born.—

Strassman⁴ gives the results of his investigations concerning the anatomy and physiology of the circulation in the new-born. Briefly, these may be tabulated as follows: 1. The explanations heretofore accepted as to the cause of the closure of the ductus arteriosus are not satisfactory: (a) Thrombosis is seldom found, and is pathologic; (b) self-closure by contraction of the duct is not demonstrated; (c) changes of position of the thoracic organs with bending of the duct after inspiration have no anatomic basis; (d) the postpartum changes in the duct-walls are neither peculiar nor characteristic, as they also occur in the umbilical vessels; (e) the impulses mentioned in *b* and *d* favor the definitive obliteration of the duct. 2. The closure of the

¹ Med. Rec., May 26, 1894.

² Le Bull. méd., No. 36, 1894.

³ Univ. Med. Mag., Sept., 1894.

⁴ Archiv f. Gynäk., Bd. xlv. H. 3.

duct comes instantly and mechanically. 3. The manner of entrance of the duct into the aorta makes possible such mechanical closure. 4. From the fifth month in the human fetus a progressive development of the angle made by the anterior wall of the duct at its entrance into the aorta forms a valvular duplication that closes the duct at the most favorable point, which is that at which the arch of the aorta becomes the descending part of the same. Similar conditions are found in fetal sheep, dogs, and cats. 5. The progressive differentiation between the pulmonary and aortic systems affords an example, as seen in the development of the valve at the foramen ovale. 6. In order to close the exit from the duct to the aorta respiration is essential. Thereby the pressure in the right heart and pulmonary artery sinks, and later rises in the left heart and in the aorta. Then the aortic orifice of the duct (already partially empty) is mechanically closed. 7. The closure does not happen (*a*) if the breathing be insufficient; (*b*) if, by reason of premature breathing through aspiration of blood, the duct be over-stretched; (*c*) if abnormal conditions of pressure obtain in the large vessel; (*d*) if the development of the duct be incomplete. 8. The finding of patency of the duct in later life without disturbance of the circulation is due to mechanical embarrassment of the aortic mouth. 9. A secondary patency of the duct arises from separation of the closed aortic orifice from the aorta, and the original closure is still demonstrable. 10. Attempts to inject with coagulated fluids confirm the closure of the duct. 11. As late as the eighth day the duct can be injected from the pulmonary artery. 12. It can be injected from the aorta only in fetuses of defective development, in over-stretched ducts, or by excessive pressure in the aorta. 13. Through over-pressure from the aorta the duct can be filled only after distending all the arterial system, and then (*a*) in the earliest days the duct-opening is forced apart; or (*b*) in the second of the first week the anterior duct-wall is inverted. 14. The aortic part of half the distended duct seems narrower than the pulmonary portion, because of the pressure on its walls from the aorta.

The Respiratory Interchange of Air in the New-born.—As the result of an extended series of observations Dohrn¹ has found that the respiratory frequency in the new-born during the first ten days of life averages 50 per minute. It is the same for boys as for girls, and for premature as well as for mature children. No regular daily change was noted during this time. During the act of crying fewer inspirations occur than during undisturbed breathing. The average is 47 per minute as against 62. The volume of air expelled with every expiratory movement averages 45 c.cm. The volume of air interchanged is alike in the two sexes, but is considerably below the average in premature children. The depth of the respiratory movements increases from the first to the tenth day, so that the volume of air expelled with every expiratory movement on the last day exceeds that of the first by 12 c.cm. This change results from the increased respiratory necessity, from the more free movement of the thoracic cavity, and from the increased

¹ Zeitsch. f. Geburtsh. u. Gynäk., Bd. xxxii. Heft 1, p. 25.

accessibility of the bronchial tubes. The depth of the respiratory movement is exceedingly slight at birth and during the entire first day. It then increases considerably from the first to the second day, and more gradually in the subsequent days. There is, therefore, no reason for believing that perfect expansion of the pulmonary alveoli is effected by the first few inspirations.

Temperature-relations in the First Week of Life.—Feis¹ contributes the results of a series of observations on the relations of temperature during the first week of infantile life. On 25 children he made 2921 observations, using a maximal thermometer, in all cases the temperature being taken in the rectum, carefully avoiding the introduction of the instrument into any fecal mass. So far as possible the observations were made under similar circumstances. The thermometer was retained fifteen minutes. The temperature of both mother and child was taken at the same time. The tables show that the child's temperature exceeded the mother's by about 0.6°C ., the sex of the child making little difference. Marked immaturity of the child seemed accompanied by a slightly lower temperature. Immediately after birth a rapid fall of from 0.86°C . to 1.7°C . takes place, chiefly through the skin, depending on the temperature of the outer air and also on the bath. Then comes a more or less rapid rise, till within about thirty-six hours the normal is reached. The amount of food absorbed by the child seems to have some influence on the temperature-augmentation.

The Care of the Umbilicus.—Doktor² reports his experience relative to the treatment of the umbilicus in new-born infants and the prevention of infections. In new-born infants the navel forms a columnar projection of the skin, on the top of which the cord is attached—a sharp line of demarcation, the *navel ring*, separating the cord from the skin. On its margin are numerous vessels that go to the border of Wharton's gelatin, but do not enter into it. When the cord is ligated its tissues lose their viability and must separate and fall away, leaving the wound covered with a living structure. This small wound is specially liable to infection and resultant maladies, light or severe: 1. Because of its condition: it is not merely a wound of the abdominal skin, but also of its wall, and in closest proximity to the peritoneum, which is very susceptible to infection. 2. The peculiarity that three great vessels lie free in this wound. 3. The disproportionately large mass of dead tissue, the remains of the cord. 4. The peculiar tendency to an excessive formation of granulations. 5. The frequency of development of anomalies and aberrations of the umbilicus also predisposes it to disease. Doktor suggests the prevention of infection by cutting the cord as closely as possible, and applying a careful antiseptic dressing, which should not be changed except for good cause. In preference to changing the dressing the bath should be omitted.

Asphyxia Neonatorum.—Some new methods of reviving an asphyxiated child have been devised and the older ones modified. Morrison,³ while

¹ Archiv f. Gynäk., Bd. xliii. H. 3, 1894.

² Ibid., Bd. xlv. H. 3.

³ Lancet, July 7 and Sept. 15, 1894.

admitting the essential cause of asphyxia neonatorum to be interference with placental circulation, prefers to group this disorder with diseases of the circulation, instead of classing it among disorders of the respiratory organs. The evidence of threatened fetal death is a decreased frequency in the number of the child's heart-beats. The usual pathologic conditions discovered include a patency of the foramen ovale; patches of extravasation of blood in the pulmonary pleuræ; on section, great congestion of the lung-tissue, which presents numerous apoplexies varying in size, and which sinks when placed in water; congestion of the liver and spleen; engorgement of the cerebral cortical vessels; and on section of the brain the presence of numerous puncta cruenta. Budin¹ classifies the methods of artificial respiration under the two heads of *direct* and *indirect*. Under the latter he places the Sylvester and Schultze methods. Under the direct methods he considers the mouth-to-mouth insufflation and the tubes of Chaussier, De Paul, and Ribemont, which latter he considers the best because it is simple and leaves one hand free for compression of the chest. It has been suggested that fracture of the clavicle should be regarded as a contraindication to resuscitation by Schultze's method, for fear of perforation of the lung by one of the fragments. Schultze claims, however, that in no phase of the swinging is it correct to push the clavicles backward. During the inspiration-swing the child should rest with its whole weight on the index fingers, which are in the axilla. In the expiratory position the infant should rest on the thumbs held before, and the four fingers which are loosely placed in the axilla and on the back. Laborde's method of strong rhythmic traction upon the tongue has given exceptionally good results when other methods have failed. Bernheim says that the action results in a reflex irritation which is referred to the respiratory center through the motions of the base of the tongue. Among the new methods that have been suggested may be mentioned that of Prochownik.² It consists in suspending the child by the feet, the head being lightly supported. If no assistant is available to hold the child's feet, the operator grasps the ankles between the fingers of his left hand. With the right he grasps the chest, the thumbs being in front, and makes six to eight regular compressions. The nose and mouth are freed from any mucus, thus allowing air to enter with the inspiratory effort. It may be necessary to douche the suspended child with warm water to assist the respiratory efforts. Rosenthal³ recommends the following method: The child is laid upon a table with the neck supported by a roll. The operator seizes the feet so that the thumbs are in contact with the soles, the index finger with the dorsums of the feet, and the ring finger resting upon the tendon of Achilles; the remaining two fingers are closed. In regular movements the knees, hips, and spine are compressed and expiration follows; by stretching the body inspiration is favored. The larynx is not compressed by this method, as is possible to be done by the Schultze method. Bedford

¹ Boston Med. and Surg. Jour., Aug. 2, 1894. ² Centralbl. f. Gynäk., No. 10, 1894.

³ Univ. Med. Mag., April, 1895.

Brown¹ strongly recommends the hypodermic injection of five or six drops of brandy or whisky, first into one arm and then into the other. He uses this method to the exclusion of all others, and has had excellent results. Cooke² employs the following method: The cord is left intact and the child placed in a position admitting uninterrupted inspection. The finger, preferably the index, is then lubricated and quickly introduced into the rectum. Coincident with the passage of the finger into the sphincter Cooke claims that respiration will be instituted with a spasmodic gasp. The procedure may be repeated as often as necessary.

Injuries to the New-born.—The fetus during the process of delivery is subject to traumatism in various forms. Cases are reported by Tarnier,³ of fracture of the clavicle; Webster,⁴ of rupture of the sinus longitudinalis in a forceps delivery; Negri,⁵ of hematoma of the liver which ruptured, producing sudden death of the child; and Edgeworth,⁶ of bilateral facial paralysis from forceps.

Tarnier states that the humerus is the bone most frequently fractured during obstetric manipulations, and next to it the femur. Fracture of the tibia and fibula are not so frequent; fracture of the clavicle is very rare. Tarnier knows of only one other case in his own experience, and in that case the cause of the fracture, which was not detected till a few days after birth, remains a mystery.

Gebhard⁷ reports a case of a child born in breech presentation, the mother's pelvis being slightly larger than the average; during the birth the fetal heart-sounds became slow, and the physician in attendance rapidly extracted the child, the extraction occupying three minutes. The child was a male and well developed; it was born asphyxiated, and was resuscitated, Schultze's method being employed among others for this purpose. Three hours after birth the child died. Postmortem examination revealed fluid blood in the right pleural cavity, with compression of the right lung, and further examination showed that during the extraction the chest of the child had been brought with such force against the mother's sacrum as to cause the partial laceration of the pleura and the hemorrhage in question. This injury was further increased by the resuscitation by Schultze's method, the pressure of the hands of the operator while swinging the child increasing the injury already done.

Gonorrheal Affections of the Mouth.—Leyden⁸ reports a case in which a gonorrheal patient infected the mouth of her babe, a yellowish pustule appearing upon the inner surface of the upper lip. Abundant gonococci were found in the discharge. The condition improved under a treatment of washes of mercuric chlorid, 1 : 7000.

¹ Therap. Gaz., Nov. 15, 1894.

² Am. Medico-Surg. Bull., Feb. 1, 1895.

³ Jour. des Sages-femmes, April 16, 1894.

⁴ Edinburgh Med. Jour., Jan., 1892.

⁵ Ann. di Ostet. e Gin., No. 4, 1893.

⁶ Brit. Med. Jour., No. 1723, 1894.

⁷ Zeitschrift für Geburtsh., Band xxx. Heft 2, 1894.

⁸ Centralbl. f. Gyn., Feb. 24, 1894.

Icterus Neonatorum.—Schmidt¹ has made *icterus neonatorum* the subject of a series of observations, especially studying the relationship between this disease and the time of section of the umbilical cord; 149 children were observed: of these, 50 were separated from the umbilical cord at once, the remainder after some time, usually after placental separation. Of the latter, 80, or 53.7 per cent., were icteric. 35 premature births were observed, and 114 at term. Of the mature births, 52 were icteric. Male children seemed more predisposed to the disease than female, the weak more than the strong. Whether, other things being equal, *icterus* interferes with the development of the child is hard to decide, since it affects those already weak in preference. In a large proportion of cases the disease appears between the first and fifth days. As to causation, several authors ascribe it to late section of the cord, whereby a greater mass of blood is thrown from the placenta into the child's circulation, and a great destruction of red blood-corpuscles and coloring-matter ensues, followed by *icterus*. The uterine compression empties placental blood into the child's system. To test this view, 50 children were at once separated from the cord at birth, and 100 later, mostly after separation of the placenta. Of the 50, 36 became icteric and 14 remained unaffected. Of the 100, 71 were observed; out of these, 30 were icteric and 41 remained well. The intensity of color and length of duration of the jaundice were more marked in those early separated than in others. As a whole, those children whose cords were separated late became icteric in less number and intensity than those detached early.

Melæna Neonatorum.—Induced by the statement of Schiff that certain intracranial lesions may induce softening and hemorrhage of the gastric mucosa, Preuschen² was led to investigate the possible etiologic relation between the gastrointestinal hemorrhages of the new-born and cerebral injuries sustained during birth. Accordingly, in conjunction with Pomorski, he instituted a series of experiments that resulted in demonstrating the relation in question. The observations were made on rabbits. A minute quantity of a saturated solution of chromic acid was injected into different regions of the brain in different animals. The hardening produced by the chromic acid and the green discoloration served to locate the seat of the injury. Melæna followed injections in the most diverse regions of the brain. Within an hour after the injection, hemorrhages were found in the gastric mucosa or in the lungs, or in both. In the stomach they were observed most frequently at the cardiac end and at the greater curvature. When the animal survived the infliction of the injury for a short time the mucosa overlying the extravasation disappeared and blood was discharged into the cavity of the stomach. In searching the literature of the subject the author finds only 5 out of 37 reported cases of *melæna neonatorum* in which the brain was examined, and even in these not minutely. In 3 cases cerebral hemorrhages had been noted, and in 2 examined by the author a similar condition existed. These intracranial hemorrhages, the author observes, are by no

¹ Archiv f. Gynäk., Band xlv. Heft 2, 1893.

² Centralbl. f. Gyn., March 3, 1894.

means rare, even in spontaneous births. They must be much more frequent in difficult labors. Following the general tendency of the day, however, Gärtner¹ supports the theory of Rehn and Neumann, and concludes that melena is an infectious disease, the mode of entrance and the course of the germ not being certain. He believes, however, that the navel is the entrance-point. He has observed two cases, and was able to identify a bacillus with the cause of the condition. The bacillus has the following peculiarities: The temperature required for its growth is that of the blood. The motion in hanging drops is peculiar and lively, the bacillus turning about its transverse axis. The multiplication is by division. In agar, and especially in gelatin, it shows characteristic culture-forms and the formation of gas. During the disease it is found in the intestinal contents and in the blood, and by section in the liver and spleen. The intestinal hemorrhages are to be regarded as the consequence of the wandering of the bacilli through the walls of the gut from the serosa, and thereby the destruction of the glandular layer. The petechia upon the serous coat of the intestine and the peritoneum, the lesser and greater hemorrhages found in the liver and the spleen, are caused by the stopping of a vessel from the large numbers of melena bacilli. The resemblance of the condition on section between animals inoculated with melena and by melæna neonatorum is identical. [We consider Preuschen's deductions as much more rational and conclusive than this infectious theory of the disease, but the question is one that can be settled only by further investigation.] Schultze² reports a case of the disease.

Conjunctivitis of the New-born.—With Von Brunner, Von Erdberg³ believes that only those cases can be counted blennorrhæal in which Neisser's gonococcus is found [an opinion that has been recently combated by different writers]. Infection at birth he considers of rare occurrence, and intravaginal infection has not been proved. The average time of incubation of the disease is from two to five days; cases in which suppuration begins at a later period after birth must be ascribed to late infection. The best prophylactic he thinks is 1:5000 mercuric chlorid. Oppenheimer has shown that the gonococcus is killed by a solution of mercuric chlorid in strength of 1 in 30,000. In fully 75 per cent. of new-born children no prophylactic instillation is called for. The thorough disinfection of the vagina before the head comes down makes it unnecessary to use anything but distilled water in the eyes. [It is wise, however, as a precautionary measure, to cleanse the external surfaces of the eyelids and the immediate surroundings with mercuric chlorid 1:1000 or iodine trichlorid 1:4000 as soon as the head is born.] Abadie⁴ earnestly supports the use of silver nitrate as a curative cauterizing agent.

Congenital Elephantiasis.—Moncorvo⁵ reports 3 cases of congenital elephantiasis: 1 occurred in the person of a rachitic child, aged four

¹ Archiv f. Gynäk., Bd. xlv. H. 2.

² Centralbl. f. Gynäk., No. 9, 1894.

³ Ibid., No. 24.

⁴ La Sém. méd., May 18, 1894.

⁵ Teratologia, No. 2, 1895.

months, in which the affection showed itself by enlargement of the two lower extremities; the second case was one of hereditary syphilis, the elephantiasis manifesting itself upon the right foot; the third was also a case of hereditary syphilis, with the lesions localized upon the lower extremities. From previous study of this subject Moncorvo believes that the pathogenic condition of elephantiasis may be present before the birth of the child, and that the process may reach the stage of fibrous formation. In one-third of the cases of congenital elephantiasis on record the morbid process has remained limited to one portion of the body, especially to the limbs. In the other cases the disease had the soft or cystic form, occasionally forming subcutaneous fibromata. Areas of vascular nevus were observed accompanying cases of the second group.

The Influence of Small-pox in the Parents in its Relation to the Susceptibility of the Child to Vaccination.—Auché and Delmas¹ conclude, from ten observations in which the father had been attacked with small-pox for from thirteen months to twelve years previously, that there appears to be no diminished susceptibility to vaccination in the child. In eight cases in which the mother had had small-pox prior to conception there were none in which vaccination was not successful either on the first or the second trial. Undoubted cases, especially those by Lop, show that this need not be the result more usually when the time of the attack has been short prior to the conception of the child. Small-pox in the father and in the mother prior to conception does not render the child more immune than when the mother alone has been attacked. If the disease is present in the mother during the course of pregnancy, several alternatives are possible: (*a*) The disease is in an incubative state in the child; it is still susceptible to the vaccine for from five to six days, more rarely from three to four days, prior to the appearance of the eruption. (*b*) The child is born either with the eruption on it or scarred. It is, of course, refractory to vaccination. (*c*) Here belong those cases in which the child has not had and does not get the small-pox. If it be born during the incubation, invasion, eruptive stage, and even the suppurative stage of the mother, it may be vaccinated with success. If it be born during desiccation or convalescence, it is in certain cases refractory to vaccination, but more often susceptible. Later on the child is usually endowed with immunity which is not instantaneous, but which seems to take a certain length of time for its production. The immunity once acquired is transitory, and lasts only for from several months to two or three years.

Hemophilia at the Onset of Menstruation.—Oliver² has reported the case of a girl, thirteen years old, who had just menstruated for the first time, the discharge at first being slight, but subsequently becoming so profuse as to threaten life. All other measures failing, the vagina was tamponed and the flow was moderated. Upon the removal of the tampon, and at the end

¹ *Archiv. clin. de Bordeaux*, May, 1894.

² *Jour. de Méd. de Paris*, No. 31, p. 379, 1894.

of twenty-four hours, the hemorrhage was resumed with its previous freedom. Vaginal injections of hot water were employed and followed by the introduction of a tampon, but without success. Upon consultation the conclusion was now reached that the girl was a hemophilic. It was learned that when a child she had fallen, injuring the head, and a large ecchymosis had formed beneath the scalp. The removal of teeth at different times had also always been followed by free bleeding. The following plan of treatment was outlined: 1. Vaginal injections, at a temperature of 122°, every two hours; 2. If the hemorrhage persisted, galvanocautic intrauterine application of 50 milliampères, followed by a tampon; 3. Treatment directed toward the general condition, especially alcohol in some form; 4. The hourly administration of hydrastinin. In this way it was hoped to control the immediate bleeding. The question also arose as to its repetition in the future. The removal of the ovaries in the hope of obviating such repetition was contraindicated by the danger of fatal hemorrhage from the operation. [This case is remarkable as occurring in direct opposition to the accepted law of the transmission of hemophilia, which is supposed to be transmitted by females and to be manifested only by males.]

Congenital Deformities and Monstrosities.—Cases of fetal monsters are reported by Hartmann,¹ Col,² Richmond,³ Austin,⁴ Tucker,⁵ Westgate,⁶ Barry,⁷ and Dickinson.⁸ Dickinson's case represents what would be classed, according to the Darwinian theory, as a reversion to the older type. This was a child with a tail. It was a well-developed female of between 5½ and 6 pounds in weight. The coccyx was covered with skin on both anterior and posterior surfaces. It thus formed a tail of the size of the nail of the little finger, with a length of nearly $\frac{3}{16}$ inch on the inner surface, and $\frac{3}{8}$ inch on the rear surface. This little tip could be raised away from the skin, and it slowly sunk back. In addition to the familiar caudal projection of the human fetus that is occasionally seen, Dickinson mentions a group of other vestigial records of a former state of things. Briefly, these are—1. The plica semilunaris as a vestige of the nictitating membrane of certain birds. 2. The pointed ear or the turned-down tip of the ear of many men. 3. The atrophied muscles, such as those that move the ear, well developed in certain people, or that shift the scalp, resembling the action of the horse in ridding itself of flies. 4. The supracondyloid foramen of the humerus. 5. The vermiform appendix. 6. The location and direction of the hair on the trunk and limbs. 7. The dwindling wisdom teeth. 8. The feet of the fetus strongly deflected inward, as in the apes, and persisting in the early months of life, together with great mobility, and a distinct projection of the great toe at an angle from the side of the foot. 9. The remarkable grasping power of the hand at birth and for a few weeks

¹ Münch. med. Woch., Feb. 26, 1895.

² Am. Medico-Surg. Bull., April 15, 1895.

³ Gross: Med. Col. Bull., vol. ii. No. 4.

⁴ Internat. Med. Mag., May, 1894.

⁵ Am. Medico-Surg. Bull., Nov. 15, 1894.

⁶ N. Y. Med. Jour., Sept. 1, 1894.

⁷ Med. Rec., Dec. 29, 1894.

⁸ Brooklyn Med. Jour., viii. 568, 1894.

thereafter, that permits young babies to suspend their whole weight on a cane for a period varying from half a minute to two minutes.

Horrocks¹ ascribes to these anal tags a pathologic importance. He

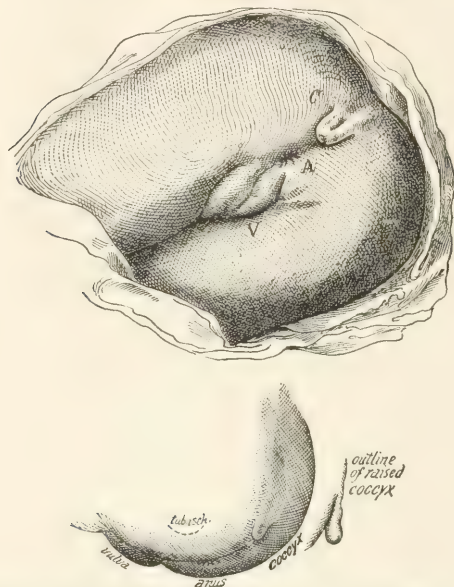


FIG. 10.—Skin-covered coccyx, forming a rudimentary tail, in a female child at birth: C, coccyx; A anus (Brooklyn Med. Jour., viii. 568, 1894).

claims that they may be productive of fissure in ano, superficial ulcerations, fecal concretions, and fistula in ano, and that they may hypertrophy and set up tenesmus and other troubles.

¹ Quart. Med. Jour., July, 1894.

GYNECOLOGY.

BY J. M. BALDY, M. D., AND W. A. N. DORLAND, M. D.,

OF PHILADELPHIA.

AFFECTIONS OF THE VULVA, VAGINA, CERVIX, AND PERINEUM.

Pruritus Vulvæ.—Sänger¹ prefers for this disease the name *dermatoneuritis vulvæ pruriginosa*, or, more shortly, *vulvitis pruriginosa*, as better indicating the true nature of the disease. He gives the following classification of the causes of vulvitis pruriginosa:

I. ENDOGENETIC CAUSES.—1. *Hematogenic*.—These include substances that are found in the blood in certain diseases (icterus, chronic nephritis, diabetes mellitus), and that cause itching by their action on the nerve-endings. Some chemic substances (morphin, alcohol, iodoform, etc.) act in a similar way when introduced into the blood. 2. *Circulatory*.—Passive congestion of the venæ pudendæ, of the hemorrhoidal veins, or of the pampiniform plexus, caused by diseases of the heart, by pregnancy, by hemorrhoids, or even by retroflexion or tumors of the uterus. 3. *Hematogenic Skin-affections*.—Erythema, urticaria, herpes, and some forms of eczema that affect the papillæ directly or indirectly, by causing rubbing of the parts.

II. EXOGENETIC CAUSES.—1. *Secretory and Chemic*.—(a) Excessive activity of the cutaneous glands of the vulva (hyperidrosis, seborrhea). (b) Continued contact with normal or decomposed urine. (c) Pathologic secretions of the vulva, vagina, and uterus; gonorrheal or desquamative vaginitis; cervical endometritis; carcinoma, or tumors of the uterus. (d) Catarrhal and purulent discharges from the rectum. This class of causes produces the most intense forms of vulvitis pruriginosa. 2. *Parasitic*.—(a) Animal parasites—pediculi, oxyuris vermicularis, etc. (b) Vegetable parasites—leptothrix, leptomitrus, probably also oïdium albicans; micrococcus ureæ and bacterium ureæ (as indirect causes); also, in a more specific manner, gonococcus; smegma-bacilli and dirt-bacteria; the various microbes of the skin and vagina; and, as causes of secondary infection of wounds produced by scratching, streptococci and staphylococci. 3. *Mechanic*.—(a) Primary: masturbation; excessive washing and rubbing; the use of unclean or infected sponges. (b) Secondary: rubbing, scratching, etc. of the affected parts. 4. *Thermal*.—The influence of temperature is illustrated by the increased itching when the patient is in bed or in a warm bath.

Schultze,² on the contrary, objects to the general use of the term vulvitis pruriginosa, since he believes that there are cases of pruritus not due to a

¹ Centralbl. f. Gynäk., No. 7, 1894.

² Ibid., March, 1894.

vulvitis, the latter condition when present being due to the irritation caused by scratching. In such cases the pruritus, he believes, is directly due to the condition of the endometrium, as demonstrated by the aggravation of the vulvar condition on the simple passage of the sound. [In this we think he is correct.] As regards treatment, Sanger says that in intractable cases of the disease partial or total excision of the vulva is a justifiable operation, and that the removal of the glans clitoridis and prepuce in older women is a proper procedure, since the changes in the nerve-endings due to the disease are such as to destroy the ordinary sexual irritability. Should the entire vulva be excised, the gap must be closed by a plastic operation. [It must be understood that such procedures are measures of last resort.] As a local application More Madden¹ claims excellent results from a lotion consisting of a strong solution of methylene-blue combined with the internal use of the same remedy in two-grain doses in pill form twice or thrice daily. [As an adjunct to other treatment this remedy is at times of use; one must never lose sight, however, of the fact that a local lesion such as an endometritis is very commonly the cause, and the main reliance must be placed in the appropriate treatment of this condition.]

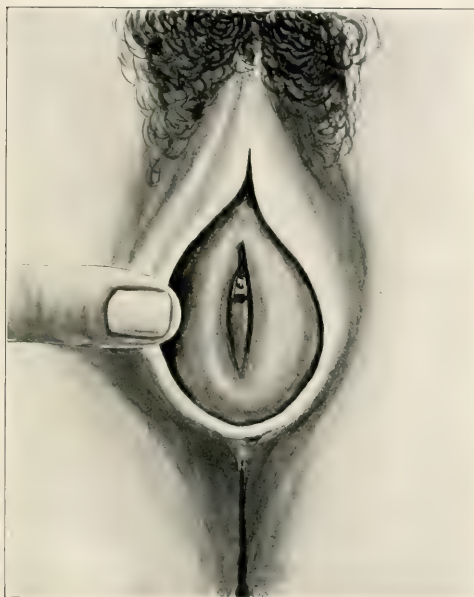
Kraurosis Vulvæ.—This term is incorrect, according to C. A. L. Reed;² he would substitute for it the name *progressive cutaneous atrophy of the vulva*. The etiology of this disease is obscure; it occurs without the previous existence of any other disease of the vulvar skin. It is fairly established that the atrophy of the vulva is not of syphilitic origin, a fact that is sufficiently confirmed by Lewin,³ who states that he has treated between seventy and eighty thousand women in his service at the Charit , and that in all this experience he has not encountered a single case of kraurosis vulv . Gonorrhea and a chronic nonspecific vaginal discharge are recognized by some observers as probable etiologic factors. The disease is more common in women after forty, and this would seem to identify it with the usual trophic changes of senility. The fact that it occurs in early life, during the active continuance of menstruation, and in the absence of any indication whatever of precocious menopause, at once dissociates it from those changes of nutrition, either local or general, that occur with advanced years. It is true, however, as Olshausen⁴ has stated, that in a limited number of cases the atrophic change seems to be inaugurated by the extirpation of the uterine appendages. The fact that the disease is limited to circumscribed areas in the vulvar integument or else to the entire pudendal skin, and the additional fact that it occurs without adequate demonstrable local cause, seem to indicate either the peripheral trophic nerve-filaments, or else the ganglia whence these originate, as the possible seat of initial lesion. The pathologic and clinical features of these cases are characteristic. The first changes obvious to the naked eye consist of small vascular areas around the introitus vagin , slightly depressed relatively to the adjacent epithelial surfaces, and exquisitely

¹ Prov. Med. Jour., Sept. 1, 1894.

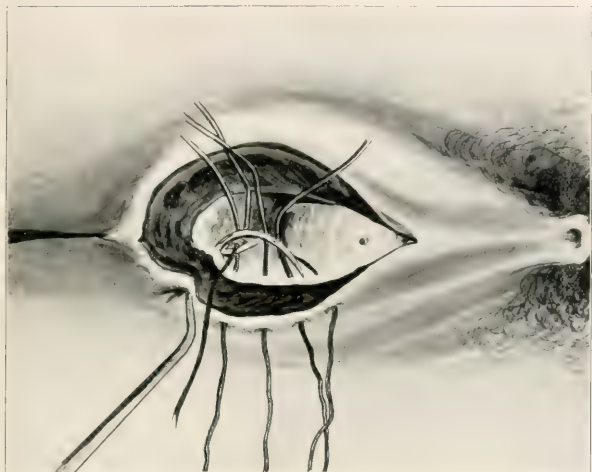
² Centralbl. f. Gyn k., No. 13, 1894.

³ N. Y. Med. Jour., Sept. 29, 1894.

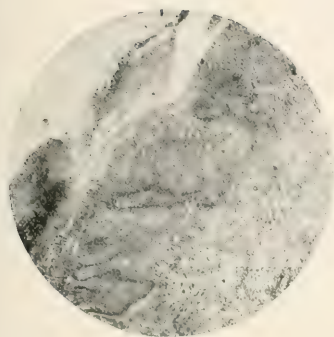
⁴ Ibid.



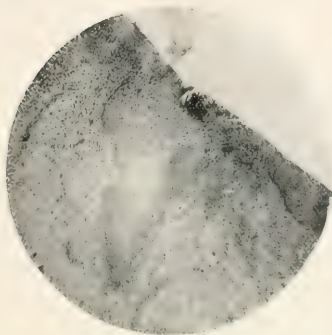
Progressive cutaneous atrophy of the Vulva (Kraurosis Vulvæ).
(N. Y. Medical Journal, Sept. 29, 1894.)



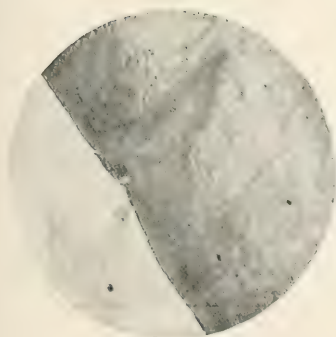
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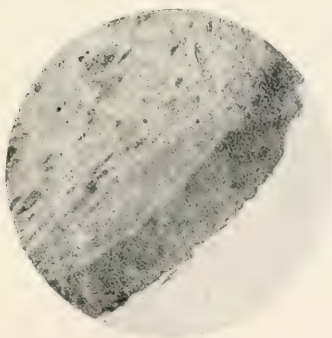
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Progressive cutaneous atrophy of the Vulva (Kraurosis Vulvæ).
(N. Y. Medical Journal, Sept. 29, 1894.)

painful to the touch; at the same time a narrowing of the vaginal orifice may be noticed, associated with diminished elasticity of the structures. The cutaneous or mucocutaneous surfaces will be observed to have lost a certain proportion of their pigment, giving them a more or less translucent appearance. The shrinkage of the tissues soon becomes very marked (Plate IX.). Microscopically, there is found a marked hyperemia of the integument, with hemorrhages into its substance and upon the surface; the epithelium is of very irregular thickness, and contains at places small rents or fissures. The effused blood lies, as a rule, directly upon the surface of the eroded epithelium (Plate XI., Fig. 1), although it is occasionally found between the epithelium and the corium. The corium presents two conditions: 1. In the earlier stage (Plate XI., Figs. 2 and 3) it is marked by cellular infiltration and in some places by pronounced hyperemia. Small round cells everywhere invade the subepithelial tissue, in some places diffusely, in others forming irregular collections. The papillæ are infiltrated, and are often occupied entirely by small round cells, so that none of the original connective tissue can be detected. In places the papillæ are covered with a very thin layer of epidermis; in others they are entirely bare, granulation-tissue extending to the surface. There are no hemorrhages into the corium. 2. *Later Stage*.—Cellular infiltration is less marked, and the corium is characterized by an almost total disappearance of papillæ (Plate XI., Fig. 4). The disappearance of the papillæ is unquestionably due to the organization and shrinking of the granulation-tissue. Various stages may be noted in any given section. Orthmann found that the pathologic change in kraurosis was primarily an hypertrophy of all the cutaneous tissues, finally passing into an atrophic and sclerotic condition. Säger¹ believes that the absence of itching may be accounted for by a rapid and serious involvement of the nerves, which become atrophied by pressure. Martin² affirms that the diagnosis of the disease depends less on the disappearance of the pigment in the parts than on the shrinking of the tissues, first in the posterior commissure and labia minora, and lastly in the clitoris and labia majora. The palliative treatment, according to Reed, consists in the application of various medicaments for the relief of pain, such as phenol, a solution of neutral acetate of lead in glycerol (Tait), and the stick silver nitrate. The curative treatment is that by excision, an ellipse of mucosa from both sides of the introitus being removed and the denuded margins united by interrupted sutures (Plate X., Figs. 1 and 2).

Vaginitis.—Griffiths³ states that the pathogenesis of membranous vaginitis must be looked for in the nervous system, as indicated by the neurotic manifestations and the appearance of a pustular rash concurrent with an increase in the discharge of the membranes at the menstrual epochs. In the treatment of simple vaginitis Chéron⁴ in the acute stage gives twice daily vaginal injections of a warm (102°–104° F.) solution of picric acid (.5 per cent.),

¹ *Centralbl. f. Gynäk.*, No. 7, 1894. ² *Ibid.*, No. 13, 1894. ³ *Brit. Med. Jour.*, June 16, 1894.

⁴ *Rev. Médico-Chir. des Mal. des Femmes*, Aug. 25, 1894.

from 2 to 3 fluidrams being used at each injection. This calms the pain, reduces the swelling, and lessens the secretion of pus. He also applies every other day resorcin 3xij and water 3x, and packs the vagina with iodoform-gauze to distend the culdesac, covers the cervix, and separates the vaginal surfaces. For the vesical symptoms Lutaud¹ applies laudanum poultices and administers internally potassium bromid, emollient drinks, and alkaline diuretics. Bond² lays much stress upon the antiseptic action of electrolysis in the treatment of vaginitis. To overcome the pain attendant upon the introduction of vaginal tampons, Guéniot employs a narrow instrument three and a half inches long and about one inch wide, and bent at a right angle so that the hand holding it shall not interfere with the other hand introducing the tampon. The right hand with this instrument raises the anterior vaginal wall, while the left forefinger depresses the posterior wall, and the tampon is then readily introduced. Gonorrheal vaginitis may be treated by a solution of potassium permanganate, 10 grams to distilled water 200 grams (this solution soils the linen), or, according to d'Aulnay,³ with the following solution: Methylene-blue, 10.0; alcohol, 15.0; potassium, 0.20; water, 200. Two or three tampons of cotton wet with this solution are introduced into the posterior vaginal fornix and retained for two days. The pus-secretion stops by the fourth day, and congestion disappears in about twenty days. Palmer⁴ claims that in gonorrheal vaginitis the vaginal douche has but a limited use. It is of service for cleansing and disinfection, either with phenol or some other of the creasols, or consisting simply of warm water. It is also of use as a means of applying the soothing influences of moist heat to the inflamed and sensitive uterus and its appendages.

Perivaginitis Simplex.—This is a new disease of the vagina, described by Maher,⁵ in which there exists a brawny hardness of the perineal body and vaginal walls, so that the vagina forms a rigid tube, all agape, with the cervix and os uteri distinctly visible at its upper end. Pressure upon the tissues causes pain. The pathology of the disease is supposed to be an inflammation and induration of the perivaginal tissues. But the one case is recorded.

Vaginal Secretion.—Before the Obstetrical Society of London, Gow⁶ demonstrated the following statements: The vagina secretes a whitish and opaque fluid resembling in appearance thick starch-mucilage, the opacity being due to the presence of numerous flat nucleolated cells; chemically, the fluid is albuminous in nature, and there is no evidence of the presence of mucin; the reaction is acid, but the fluid when secreted is alkaline; the acidity depends upon the presence of bacteria, that are not, however, pathogenic. Stroganoff⁷ states that the vagina constitutes an unfavorable locality for pathogenic microbes, particularly for the staphylococcus and the streptococcus; the action of the secretion of the habitual (non-pathogenic) vaginal microbes aids in this means of defence of the organism; the cervix, likewise,

¹ Rev. Obstét. et Gyn., Jan., 1894.

² Jour. de Méd. de Paris, Dec. 16, 1894.

³ La Sém. méd., No. 53, 1893.

⁴ Jour. Am. Med. Assoc., June 9, 1895.

⁵ Med. Rec., March 31, 1894.

⁶ Brit. Med. Jour., Jan. 13, 1894.

⁷ Annales de Gyn. et d'Obst., March, 1894.

is unfavorable to the development of the pathogenic microbes, but the question of the normal vaginal flora is still unanswered. The bacteria that are most commonly found in the vagina are the bacillus vaginae, which produces the lactic acid of the vaginal secretion, and the streptococci, the pyogenes aureus, and other septic staphylococci.

Varicocele of the Rectovaginal Septum.—Under this term Chéron¹ describes a varicose condition of the veins in the rectovaginal septum, recognized as a hard, sensitive, elongated swelling, that may extend from the posterior fornix as far down as the lower third of the vagina. It is often associated with hemorrhoids, both being due to obstruction of the intrapelvic veins, caused by various affections. Lumbar neuralgia is one of the accompanying symptoms. Treatment consists in the removal of the cause, massage of the swelling, steady pressure exerted from below upward after local anesthesia by means of a 10 per cent. cocain solution, and the administration of one or two pills of *capsicum annuum*, each $1\frac{1}{2}$ gr., during the progress of the meals.

Vaginal Prolapse.—*Kolporrhaphy.*—In the treatment of vaginal prolapse by kolporrhaphy Truzzi² suggests the transplantation of decalcified bone in the site of denudation, with the object in view of combating the lack of local nutrition of the tissues by the presence of an absorbable heterogeneous body, and thus provoking the formation of a fibrous tissue, which, without causing any damage to the functions of the vaginal canal, may serve to replace or reinforce the sustaining action of the columnæ rugosum. He employs for the purpose the diaphyses of the femora or humeri of rabbits, or the diaphyses of the tibiæ of fetuses at term accidentally killed during accouchement. The bone is completely decalcified in HCl (10 to 100), when the diaphyses can be readily separated, cleansed of medullary tissue, and cut into lamellæ; these are washed in sterilized water and then in alcohol, and can then be kept for an indefinite period in juniper-oil. When used the lamella is placed in the deepest part of the wound, which is then sutured. [The future utility of this procedure is more than doubtful, and these original experiments are probably the last that will ever be heard of it.]

Dissatisfied with the results of the median operation, T. J. Watkins³ has employed lateral kolporrhaphy about 75 times, with almost uniformly satisfactory results. The technic of his operation is as follows:

The patient is placed in the left lateral position, the anterior vaginal wall is exposed by Sims' speculum, and a point in the left sulcus just above the fold of mucosa (the remains of the hymen) is caught by a tenaculum. The denudation is commenced at this point, and is extended to a point beyond the prolapse. This point may be opposite the neck of the bladder, or the denudation may extend even as far as the lateral aspect of the cervix uteri. The breadth of denuded surface is dependent upon the extent of the urethrocele and cystocele. The denudation is extended on the posterior wall

¹ Rev. Méd.-Chir. des Mal. des Femmes, No. 1, 1894.

² Annales de Gyn. et d'Obst., June, 1894.

³ Am. Gyn. and Obst. Jour., New York, April, 1895.

sufficiently to obtain fixed points for the sutures in its connective tissues, and on the anterior wall sufficiently to take in all redundant tissue without narrowing the vagina to less than its normal size, or producing tension on the sutures (Fig. 1). The denudation may be upon one or both sides accord-

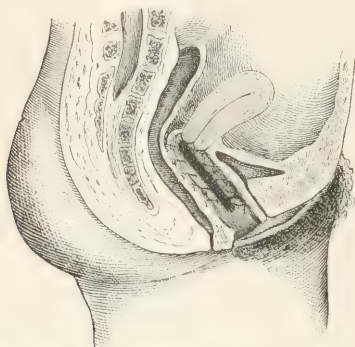


FIG. 1.—Watkins' method, lateral colporrhaphy (Am. Gyn. and Obst. Jour., April, 1895).

ing as the relaxation is unilateral or bilateral. If the denudation is extended too near to the meatus urinarius, it interferes with the perineorrhaphy that ordinarily should be performed at the same sitting. The uterus is now placed in its normal location and anteverted. Beginning at the urethral end of the denudation, buried silkworm-gut sutures are passed obliquely from

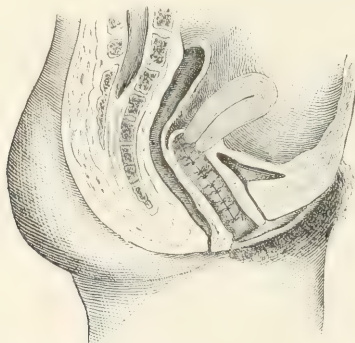


FIG. 2.—Watkins' method, lateral colporrhaphy (Am. Gyn. and Obst. Jour., April, 1895).

side to side, about one-quarter of an inch apart, so as to slide the anterior upon the posterior vaginal wall, and the obliquity should be sufficient to restore the prolapsed wall to its normal location. The obliquity will therefore vary directly with the amount of prolapse, and will have to be deter-

mined in each individual case (Fig. 3, A and B). The sutures should include as much connective tissue as possible, care being taken not to injure the bladder, ureter, or urethra. The sutures should be placed deeply into the posterior wall, so as to include the fascia, and as deeply into the anterior

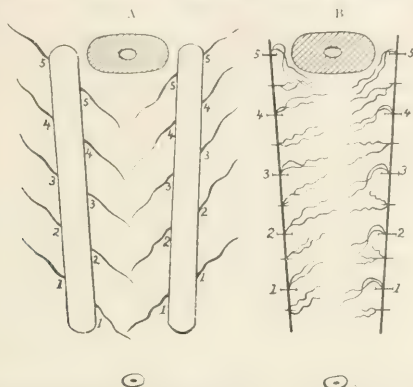


FIG. 3.—Watkins' method, lateral colporrhaphy (Am. Gyn. and Obst. Jour., April, 1895).

wall as its thickness will permit. Artery-forceps may be used for temporary hemostasis. The right side is now denuded and sutured in like manner. The wound is thoroughly irrigated or cleansed with wet sponges, and the sutures are tied from above downward. Superficial sutures are used when necessary, to make accurate closure of the wound or to stop oozing. The ends of the sutures are left about half an inch long (Fig. 2).

Vaginismus.—Baldwin¹ defines vaginismus as “a condition of spasmodic contraction of the muscles surrounding the entrance to the vagina that precludes the possibility of coition or renders it painful.” This is distinct from the rarer condition in which entrance to the vagina can be effected, the spasm coming later and rendering withdrawal difficult or impossible. In operating for the removal of vaginismus he much prefers Skene's method, in which he carefully coaptates the cut edges of the mucosa. More Madden² employs constitutional nerve-sedatives and tonics to allay the general neurotic condition, and the application of local nerve-stretching to the affected parts by means of a widely-expanded speculum, the patient being anesthetized. Pozzi³ has performed the following operation for the relief of vaginismus: The hymen was first incised with scissors and the vulva forcibly dilated with an anal speculum. A lateral incision about one and one-half inches long was then made from right to left at the junction of the lower and middle thirds of the vulvar orifice, extending a little below the line of insertion of the hymen and forming a cross with it. The fibers of the constrictor cunni

¹ Brooklyn Med. Jour., Dec., 1893.

² Prov. Med. Jour., Sept. 1, 1894.

³ Le Mercredi méd., No. 20, 1894.

were exposed and their superficial bundles divided. The flaps were then dissected up, forming an elongated lozenge-shaped wound with its long axis parallel with the edge of the vulva. This was closed with silk-worm-gut sutures in such a manner that the line was at right angles with the original incision. By performing this operation on both sides the result is practically the same as in Tait's double flap-splitting perineorrhaphy. The vulva is enlarged and the mucosa of the vagina is rolled out in such a way as to sustain during coitus the mechanical friction that originally gave rise to reflex symptoms. The operation is applicable to all cases of vaginismus due to hyperesthesia and contraction of the vulva, but is contraindicated when the spasm is a reflex one, symptomatic of a more remote genital affection.

Annular Stenosis of the Vagina.—Cases of this rare condition are reported by Ostermann¹ and Vineberg.² The mode of origin of congenital stenosis is not clearly settled. Breisky and others maintain that the cause is to be sought in fetal inflammatory processes, and that they probably most often occur during the latter period of intrauterine development. On the other hand, other observers hold that its origin is due to an arrest of development of Müller's ducts. The treatment usually followed consists in forcibly rupturing the constriction or making a crucial incision into it, and stitching the incised membrane together in the long axis of the vagina. This operation must be followed by dilatation with glass plugs.

Hydrocele in the Female.—Smith³ is inclined to believe that hydrocele of the canal of Nuck is not so rare as is supposed. In less than four years five cases have been operated upon in the Tottenham Hospital out of 3200 patients treated at that institution. In the radical cure of this condition Gerke⁴ objects to simple puncture, since half the cases so operated upon are not radically cured, and there is danger of peritoneal infection. He has twice practised excision of the sac and then closed the canal, as in the usual radical operation for inguinal hernia, with excellent results.

Vulvar and Vaginal Tumors.—According to D. Berry Hart,⁵ malignant disease of the vulva constitutes not more than 1 per cent. of all malignant disease of the genital tract. He has had under his care six cases of vulvar epithelioma, upon five of which he operated. Operation is very generally followed by recurrence. If the inguinal glands are involved, they should be removed, either the superficial ones only, as recommended by Küstner, or, better still, there should be, as recommended by Rupprecht, a thorough clearing out of the femoral space, with division of Poupart's ligament and removal of the glands from the sheath of the femoral vessels, if necessary. Rupprecht's incision extends from the pubic spine to the anterior superior iliac spine, the ends being joined by incisions passing below the glands; this flap is entirely removed; the vena saphena may be ligatured if necessary. Schweitzer⁶ reports a case of primary carcinomatous growth of

¹ Centrabl. f. Gynäk., No. 5, 1894.

² Brit. Med. Jour., July 28, 1894.

³ Practitioner, London, Feb., 1895.

⁴ Medico-Surg. Bulletin, June 15, 1894.

⁵ Deutsch. med. Woch., June 7, 1894.

⁶ Archiv f. Gynäk., Bd. xlv. Heft 2, 1894.

the right Bartholin's gland, that had attained the size of a pigeon's egg. The inguinal glands were enlarged, and after excision of the tumor there was a rapid recurrence in these glands. Gatti¹ reports a case of primary sarcoma of the vagina, and Oliver² two cases of primary epithelioma of the vagina. Kelly³ has collected the records of twenty cases of lipoma of the labium majus—a growth of more than ordinary rarity. In the treatment of vulvo-vaginal vegetations Raulin⁴ has employed with great satisfaction the method formerly employed by Tomaso de Amicis, Jullien, and Derville—namely, cauterizations with pure phenol, the neighboring parts being covered with vaselin to protect them from the acid. Lutaud⁵ claims that vegetations of small volume are always modified and their development arrested by desiccant and astringent powders. Of these, powdered savin and salicylic acid are probably the best, applied three or four times daily after the parts have been bathed in Van Swieten's liquid. Caustic agents give better results, but their employment is more painful, chromic acid, salicylic acid, and phenol being those most often used. In vegetations of larger size grattage and excision are usually indicated. The ligature and the thermocautery may be of service, but the latter should be reserved for voluminous papillary tumors with large pedicles.

Perineorrhaphy.—In operations upon old lacerations of the perineum Wylie⁶ remarks that the aim should be to reunite the separated edges of the levator ani muscle and the pelvic fascia, and fix them to and in front of the lower end of the rectum and the upper part of the anus, and thus prevent the fecal matter from forcing forward the anterior wall of the rectum and putting on the stretch the posterior wall of the vagina, and in this way displacing the uterus downward and throwing the fundus backward between the uterosacral ligaments. This can be done efficiently only by denuding the retracted tissues on either side of the rectocele, and uniting them over and in front of the rectocele. As the most important laceration is within the ostium vaginæ, to reach these tissues the operation must be within the vagina; and to secure good apposition and to avoid dragging down and adding to the tension, most of the sutures should be passed within the vagina from side to side, so as to unite the edges of the pubococcygeus muscle and the pelvic fascia in front and over the upper end of the anus and the lower end of the rectum, in such a way as to deflect the fecal matter, as it descends to the lower end of the rectum, back through the anus, and thus effectually prevent the formation of the rectocele with its results on the vagina and the uterus. [This procedure is a modification of the original Emmet operation, and is not nearly as feasible or efficient.] In treating complete tears of the sphincter ani muscle Kirwan⁷ first closes the rectovaginal septum, then denudes the retracted ends of the sphincter muscle, catches them with tenaculi, and sews the freshened ends securely together by two or three interrupted sutures; he then

¹ Centrabl. f. Chirurg., Sept. 1, 1894.

² Lancet, Aug. 4, 1894.

³ Johns Hopkins Hosp. Rep., Aug. 9, 1894.

⁴ Jour. de Méd. de Bordeaux, May 27, 1894.

⁵ Jour. de Méd. de Paris, Feb. 25, 1894.

⁶ Med. and Surg. Rep., Sept. 1, 1894.

⁷ Am. Gyn. and Obs. Jour., March, 1895.

unites the other tissues of the floor. Outerbridge¹ suggests a new and short method of closing the perineum that he has employed in over one hundred and fifty perineal operations without a single failure. The operation is as follows: The usual denudation is made, but three sutures, however, are required to coapt these denuded surfaces. For the upper suture, or the one nearest the cervix, a medium-sized catgut is required, about ten inches or a

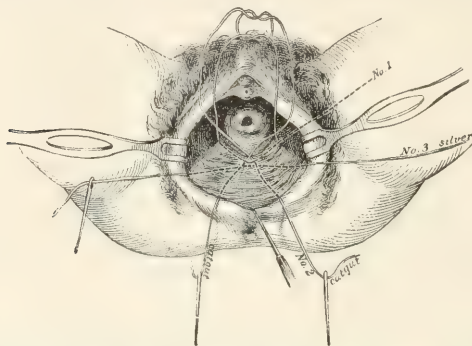


FIG. 4.—Outerbridge's method of peritoneal repair (N. Y. Med. Rec., April 21, 1894).

foot long, with a cervix (common) needle at either end. This will not only answer for the upper suture, but will also go to form the lower suture without the use of more catgut or a change of needles. Everything in readiness, one needle should be imbedded in the "crest," or undenuded tongue that is in the center of the vagina, and continued along the upper line of denudation, coming out at the right upper angle in the undenuded tissue. The other should be continued in a similar manner to the left, coming out at the left upper angle. This catgut suture should not be ligated, but the needles on either end of it thrown over the symphysis—to have them out of the way. The next suture should be of silver, and the needle imbedded one-quarter of an inch above the denuded tissue, midway between the upper and lower points of denudation—or, in other words, at the highest point of the denudation on the left side of the labia—and passed from left to right, coming out in the corresponding place on the opposite side, care being taken to have this imbedded from side to side. At this stage the wire suture is left in place with a clamp at either end, and the upper or catgut suture should be ligated, care being first taken to approximate the central point or tongue and the right and left angles. In order to do this it is often necessary to depress the central part with a tenaculum or its handle. After this is thoroughly secured one of the needles on the end of the catgut in this now central point is passed downward and outward under the denuded tissue, and brought out on one side of the labium about one-half inch above the lower point or angle of denudation; the

¹ N. Y. Med. Rec., April 21, 1894.

other needle should be passed in a similar manner on the corresponding side (Fig. 4). This last catgut or lower suture should now be tied, care being taken to draw it tightly. This closes completely the lower angle of denudation. The silver (or middle) suture is next to be twisted, which brings the two sides together, and should make the whole perfectly firm, and every part should be in perfect apposition. Occasionally a superficial suture is required when the sutures are not in proper position. Outerbridge claims for this method of suturing: 1. That it lifts the posterior wall up to the anterior, and makes a very firm and normal perineum; 2. That it consumes very little time, and so lessens largely the dangers of anesthesia—the operation by this method can easily be done in from six to fifteen minutes, depending on the dexterity of the operator; 3. That there is infinitely less irritation on account of the limited number of sutures; 4. That it is almost impossible for any sloughing to occur, as it takes up all redundant tissue; 5. That one suture only has to be removed; the other—or catgut—sutures are absorbed. This operation requires very few instruments, and certainly the expense of sutures and needles is very trivial. Three common cervix-needles are required, one piece of medium-sized catgut about ten inches long, one silver suture six inches in length, and one shot. The instruments required are three tenacula, one pair of universal scissors, sharp-pointed and curved on the flat, one needle-forceps, three needles, one wire-forceps, and scissors. [The history of all perineal operations in the past that have had for their aim the reduction of the number of sutures to a very few has been that of failure—failure to properly bring the tissues together, failure to draw them back from the vulvar orifice toward the cervix, failure to keep them back when once drawn into place, failure to impress the profession with their efficiency. There is nothing about the present proposal to promise anything better.]

CONDITIONS OF THE CERVIX UTERI.

Tuberculosis.—Meyer¹ reviews the literature of tuberculosis of the cervix uteri, and reports a case of this disease. From his summary it would appear that the views of the several observers who have written upon this subject differ widely. Rokitsansky believed that tuberculosis of the cervix is always limited. Lebert believes it never occurs. Paulsen describes it as tubercular erosion of the cervical canal, and says it never invades the vaginal cervix. Mosler found it in four out of forty-six postmortem examinations made upon women who had died of tuberculosis, and Kolb and Hegar give similar results. All observers, except Friedländer, believe it occurs only secondarily; Friedländer, however, in making a postmortem examination upon a woman dying of apoplexy, found a tubercular area the size of a cent on the vaginal cervix, abundantly covered with miliary tubercles containing giant-cells, and surrounded by a small round-cell infiltration. Meyer reports the case of a tertiparous woman, thirty years of age, with a

¹ Archiv f. Gynäk., Bd. 45, Heft 3, 1894.

negative family history. In 1887 she had pneumonia, and the next year perityphlitis. At six years of age a small nodule appeared on her right cheek, which, when it was removed in 1879, was diagnosed as lupus, and had reached the size of a quarter-dollar. It reappeared after four years, and was again removed in 1889. Since this time the patient has been healthy. Since 1886 menstruation had become progressively irregular and profuse, and in the interval between menstruations she had leukorrhea. By vaginal examination the uterus was found to be small, normal in position, and movable. The cervix was somewhat enlarged, hard, and nodular; the adnexa normal. The cervix presented a livid erosion that bled easily. The uterine cavity measured three inches. Thinking the cervix the seat of beginning carcinoma, a portion of cervical tissue was excised for microscopic examination. The result was negative, but, as hemorrhage continued, the cervix was amputated. Sections through the amputated cervix showed a circumscribed area of tuberculosis in the vaginal portion of the cervix very near the cervical canal, composed of tubercles half the size of a pea, surrounded by small round-cell infiltration. The tubercles contained many giant-cells with multiple peripheral nuclei, the remaining ground-substance being indistinctly seen. The specimens were stained for tubercle-bacilli, but none were found. That the condition was not a gumma is shown by the fact that there was no cell-proliferation of the blood-vessel intima, and the history and examination of the patient gave nothing characteristic of syphilis. That the giant-cells were not those found in granulation-tissue is positive, since no granulation-tissue was present. Although no tubercle-bacilli were found, Meyer believes the condition was undoubtedly tuberculous, as the tissues described are characteristic of this disease only. That the disease was primary he is quite positive, since no other lesion could be found, and the patient had been free from lupus since 1889. Even if lupus were present, the relation between it and tuberculosis is not definitely known, the present general opinion not being in the affirmative. That it was not secondary to tuberculosis of the tubes and of the uterine mucosa is shown in that they were found to be normal. Menstruation for three months following operation was normal; it then again became irregular and profuse, and has continued thus for three months. Otherwise the patient is perfectly healthy, there being no vaginal discharge and no possible manifestation of tuberculosis anywhere. That the hemorrhage was not due to the lesion is shown in its recurrence after operation. Should this patient not present further symptoms, the case will represent an almost unknown primary tubercular lesion.

Hypertrophy of the Cervix.—Thomson¹ believes that this condition is congenital rather than inflammatory; at least, in all cases in which the increase in length is extreme—the so-called “tapiroid cervix.” Küstner has observed it in the new-born infant. The rarity goes against the theory that it is due to any kind of sexual abuse or to injury during labor. Thomson

¹ Centralbl. f. Gynäk., No. 16, 1895.

describes a very marked case. The patient was twenty-five years old, and apparently a virgin. She had felt bearing-down pains in the pelvis for ten years. About six years previously she first noticed something projecting from the vulva, especially after a walk. The period was regular, free, and painless. The diseased, or, rather, abnormal, cervix gave a little trouble when walking or standing, but the patient was subject to obstinate constipation, and this accounted for much of the inconvenience of which she complained. When the patient lay down the cervix projected over three inches beyond the vulva. The os externum was of the normal virginal type. The sound passed over five inches till it stopped at the os internum. The supravaginal portion of the cervix seemed of normal length; the uterus was small, retroflexed, and somewhat low in the pelvis. The hymen was not torn, but was extremely stretched. The cervix was amputated by the bloodless method; the sutures were removed on the twelfth day; the uterus and the stump of the cervix then measured a little over two and a half inches. The abnormal amputated structure showed no sign of inflammation, though it was edematous.

Stricture of the Cervix.—Strictures of the lower segment of the uterus are frequently encountered, producing dysmenorrhea, sterility, and endometritis by retention. Owing to the ill-success following catheterism, dilatation, or discission, Vulliet¹ recommends the following plastic operation: By a curved incision the vagina is separated from its anterior insertion on the cervix, and the latter is decorticated up to the angle of flexion, the bladder being drawn away by means of a sound introduced into it. A grooved sound is passed into the uterus, the groove being directed anteriorly, and that organ is fixed. The point of a knife is pushed through, a little above the extremity of the cervix, until it reaches the groove of the sound, and the incision is carried upward for two centimeters above the stricture. Another incision is then carried from the lower end of the first, spirally, embracing the left half of the cervix, and ending at the external orifice, more or less behind according to the length desired to be given to the flap. The flap thus formed is a triangle, its base adhering to the intact part of the cervix, and by this base the flap is nourished until it is well united to the parts to which it is sutured. The summit of the flap is now seized with forceps, and a suture is passed connecting it with the upper end of the incision. Two or three others are passed through the borders of the flap, uniting it with the lips of the vertical incision. The cervix is thus widened the same amount as the width of the flap. The wound is closed by suturing the upper point of the vaginal incision to the cervix with the same suture that united the flap; the parametrium is thus closed off. It is easy to understand that a part of the flap will remain intravaginal, and that another part will be in the parametrium. It is important that this second part should be entirely free from mucosa, and it is easier to remove this at the beginning before the formation of the flap than when the latter is already detached.

¹ *Centralbl. f. Gynäk.*, Jan. 27, 1894.

Trachelorrhaphy.—In writing on the abuse of trachelorrhaphy Pryor¹ says that the operation is commonly misapplied. The procedure should be limited, he believes, to the immediate operation for hemorrhage, and to those cases of tear through the cervix from the internal os out to the vaginal junction—cases of true extraperitoneal rupture of the uterus. Slight lacerations, he claims, are not productive of erosions, cervical hypertrophy, cystic degeneration, sterility, and subinvolution, nor of reflex symptoms save to a very limited degree. On the contrary, he considers lacerations of moderate length as beneficial, as favoring the escape of the secundines and lochial discharge. A pathologic laceration of the cervix requiring trachelorrhaphy he defines as any rent of sufficient severity and degree to implicate the circular fibers of the cervix to such an extent as to cause a modification in the shape or position of the uterus. The great objections that he urges against trachelorrhaphy are that it does not give a cervical canal of dimensions equal to the requirements of a woman who should continue to bear children with increasing ease as years pass by; it does not remove sufficient tissue when the operation is indicated; and it does not appear to him as a rational procedure, because so often, in his view, unrequired. If the development of carcinoma be feared, then he would advise amputation of the cervix rather than the operation of trachelorrhaphy.

FISTULÆ.

Vesicovaginal Fistulæ.—McLean² has devised a simple contrivance for steadying the wall of the bladder in the operation for vesicovaginal fistula. It is particularly serviceable in cases in which the upper vesical walls protrude through the fistula. Eight or ten inches of rubber tubing are attached by a short glass connecting-tube to an ordinary toy balloon. The latter is passed, when collapsed, through the fistula into the bladder, and is then distended with about five ounces of warm sterilized water or an equal quantity of Thiersch's solution. The distended balloon is drawn down firmly into the fistula by means of the rubber tubing, which is clamped and held on one side or the other as the different steps of the operation proceed. By this means the edges of the fistula are held steadily in view, so that denudation is easily performed with accuracy. The hemorrhage is well controlled by the pressure from within, and blood is prevented from entering the bladder. Before the sutures are tightened the balloon is permitted to collapse, and is then rapidly withdrawn.

Closely allied to this is the device suggested by Corson,³ which is nothing more than a small hollow rubber ball, such as is found in toy-shops, cut in half and a strong silk ligature passed through the dome of the disk thus formed, with the knot tied on the concave surface. The disk is pared down to such a size that it will enter the fistulous opening by drawing on the

¹ Am. Jour. Med. Sci., June, 1894.

² N. Y. Jour. of Gyn. and Obst., March, 1894.

³ Am. Jour. of Obstet., Aug., 1894.

ligature, when the vesical tissues will become more tense and will be brought into better view; the paring of the edges is thus greatly facilitated, hemorrhage can more readily be arrested, and the sutures more quickly introduced. After the sutures are placed the disk can be removed by separating the sutures and compressing the rubber by a pair of forceps.

Among the new methods of operating described during the year is that of Mackenrodt¹ for large fistulæ. The anterior vaginal wall is put on the stretch by traction on the portio and the urethrovaginal septum below the fistula, any existing cicatricial bands being divided. The bladder is also dissected off from the uterus as high as possible. A median incision is made through the vaginal mucosa between these two points, and in a line with the middle of the fistula; the edges of the latter are then split and the anterior vaginal wall is dissected off from the bladder, as in vaginal fixation of the uterus. The edge of the fistula is denuded, and the opening in the bladder is closed with sutures of silkworm-gut; if necessary, a second layer may be introduced in order to fold in the redundant bladder-wall. The corresponding edges of the vaginal opening are then denuded, the fundus uteri is drawn downward as in vaginal fixation, and is united to the flaps of the vaginal wound, thus blocking the opening. Mackenrodt proposes this operation as a substitute for the most severe abdominal method of closing complicated fistulæ, or for kolpocleisis, and believes that with it no case should be regarded as incurable. Von Dittel's² method for chronic and difficult fistulæ is as follows: The patient resting in the Trendelenburg posture, an incision is made from the umbilicus to the symphysis pubis in the median line, after which the uterus is seized with a volsella forceps and drawn upward and backward. The bladder is then carried upward, and held firmly against the symphysis while a transverse incision is made in the vesicouterine fold and the fistula exposed. The edges of the latter are then denuded, and the parts approximated and held in place by interrupted sutures. A drainage-tube is placed in the vaginal opening and the abdominal opening is closed. Ferguson³ has devised the following method: The fistulous opening being exposed, an incision is made through the mucosa of the vagina at the distance of a full eighth of an inch from the margin of the fistula: this incision is extended till it completely encircles the opening. The line of incision is carefully deepened till the lining membrane of the bladder is reached, and great caution is exercised in retaining the integrity of that membrane. In this manner a circumferential flap, hinged by the mucosa of the bladder, is obtained. This flap is inverted into the bladder, thus forming a roof for the broad raw surface exposed, and it is held in such position by a continuous suture of fine chromic catgut, inserted in such a manner that the stitches do not pierce the wall of the bladder. This closes the opening by a strong flap, and the operation is completed by placing sutures that do not include the mucosa of the bladder. By this method there is no loss of tissue, and a very broad raw

¹ *Centralbl. f. Gynäk.*, No. 8, 1894.

² *Wiener klin. Woch.*, No. 25, 1894.

³ *Brit. Med. Jour.*, Feb. 24, 1894.

surface is obtained for apposition. Bond¹ suggests repair of a vesicovaginal fistula by operation from within the bladder when the fistula is extensive and situated high up near the uterus. After injection of the bladder a vertical incision is made above the pubes on a sound, the peritoneum being carefully drawn away. The incision is parted by retractors and the fistula exposed. The thin cicatricial junction of the two mucosæ is incised all around, and two flaps of vesical mucosa are raised, one on either side of the rent, with their edges inverted toward the bladder. These are sutured together and the fistula is closed. By this suprapubic method it is claimed that there is absence of all tension within the bladder. For the so-called incurable vesicovaginal fistulæ Tiollier² recommends the formation of a subpubic urethra after closure of the vulva. [The necessity of opening the bladder from above should never occur; any fistula that is curable can readily be managed by other and simpler methods. The only incurable fistulæ that exist at the present day are those in which so much tissue is lost that the edges cannot be brought together, in which case opening the bladder from above would do no good.]

Rectovaginal Fistulæ.—As regards the etiology of this condition, Clarke³ does not believe that the obstetric forceps is ever responsible. It may follow rupture into the vagina of an ischiorectal abscess, prolonged pressure of the fetal head, traumatism, fecal impaction, stricture of the rectum, appendicitis with burrowing of the pus, malignant disease, and imperfect closure of perineal lacerations. In the repair of these fistulæ Ferguson⁴ applies a method similar to that employed by him in the treatment of vesicovaginal fistulæ; the part turned into the rectum is, however, clamped with a pile-clamp and burned off with the actual cautery. The clamp remains in position till the sutures are placed in the vagina, the rectal mucosa being avoided. Robson⁵ suggests a method that does not require paring of the edges of the fistula, and hence obviates the necessity for removal of tissue. The patient in the lithotomy position, the fistula is laid open by cutting through all the tissues intervening between it and the surface, the vagina being thus made continuous with the rectum by a slit instead of a fistula. Assistants, standing one on either side, place a hand on the skin over each tuber ischii and retract gently, converting the H-shaped gap into a transverse wound, as shown in the diagrams (Figs. 5, 6, 7, 8); pointed scissors are then employed to open up the rectovaginal septum so as to convert the narrow edge into a raw surface; slits are then made on each side straight forward for about an inch, as in Tait's operation for perineorrhaphy. The angles being drawn forward by catch-forceps, two or three chromicized catgut sutures are inserted just on the wound-side of the vaginal mucosa, so as to form the vaginal floor by closing the V-shaped slit, and in the same way two or three chromicized catgut sutures are inserted on the wound-side of

¹ *Annals of Surg.*, Oct., 1894.

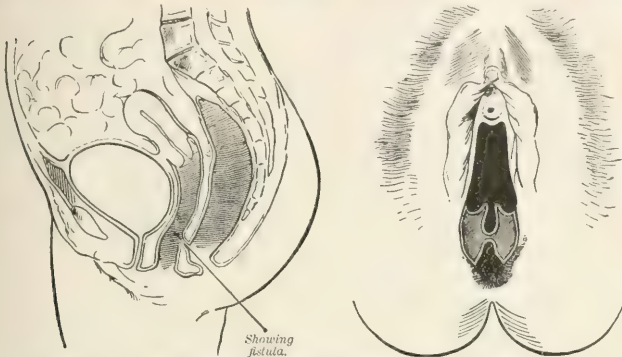
² *Lyon méd.*, June, 1894.

³ *Jour. Am. Med. Assoc.*, Aug. 11, 1894.

⁴ *Loc. cit.*

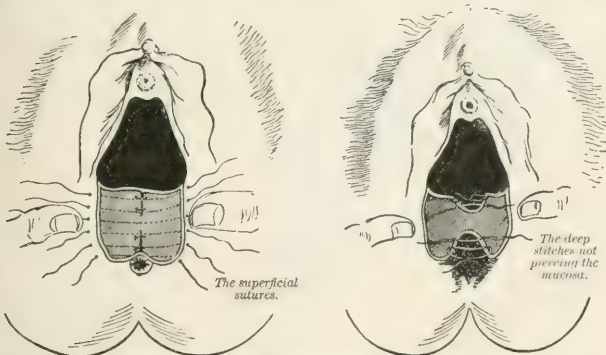
⁵ *Prov. Med. Jour.*, Aug. 1, 1894.

the rectal mucosa, so as to form the anterior rectal wall by closing the V-shaped slit in the rectum; these sutures are cut off short and will be buried. There now remains a large rectangular raw surface, which can be rapidly



FIGS. 5, 6.—Robson's operation for fistula (Provincial Med. Jour., Aug. 1, 1894).

closed by from four to six silkworm-gut sutures entering on one side at the skin-junction and emerging on the other at the same spot. Before drawing



FIGS. 7, 8.—Robson's operation for fistula (Provincial Med. Jour., Aug. 1, 1894).

tight the last series of sutures the wound is bathed with a 1 : 2000 solution of mercuric chlorid. No vessels are ligatured. When the final sutures are tied the parts look perfectly normal and no raw surface can be seen.

Ureterovaginal Fistulæ.—Hochstetter¹ has been able to find records of 39 cases of ureterovaginal fistulæ, of which 23 were caused by difficult labors, 10 followed total extirpation of the uterus, 2 the opening of a pelvic

¹ Boston Med. and Surg. Jour., Aug. 12, 1894.

abscess, 1 the spontaneous breaking of an abscess, 1 from ulceration caused by a pessary, and in 1 case the cause was not given. The frequent performance of vaginal hysterectomy renders the study of fistulae from this cause of interest. In the repair of such a case Mayo¹ reports a successful reimplantation of the ureter into the bladder—an operation termed by Bazy of Paris *urterocystoncostomy*, and suggested by him as a substitute for nephrectomy in these trying cases when the renal organs are unaffected. Penrose,² assisted by Baldy, has performed this operation after excision of an inch of the left ureter for carcinomatous involvement. The distal end of the ureter was ligated, and the proximal end implanted in the bladder according to Van Hook's method, which consists in tying the lower end of the ureter, then making a slit into it below the ligature, and invaginating the upper end into the lower through this slit. A perfect cure followed. Similar cases have been reported by Kelly, Krug, and Bache Emmet. Novaro's³ operation is precisely the same as that suggested by Bazy.

The Vaginal Anus.—This is a term applied by Buckmaster⁴ to those cases in which there is an absence of the normal anus, the rectum emptying its contents through the vagina. He admits that the term is open to criticism, because when in fetal life the partition between the rectum and the urogenital sinus fails to form, both passages open into a cloaca; it expresses, however, the conditions present, and he considers it far less cumbersome than the strange appellation *atresia ani vaginalis*. The malformation is very

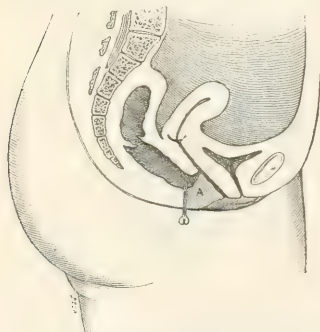


FIG. 9.—Buckmaster's operation for "vaginal anus" (N. Y. Med. Jour., Aug. 11, 1894). A represents a side of the triangular wound made by the incision.

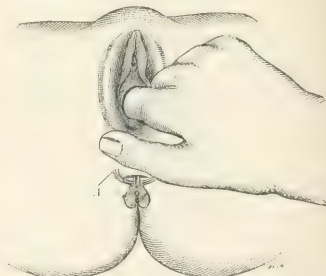


FIG. 10.—Buckmaster's operation for "vaginal anus" (N. Y. Med. Jour., Aug. 11, 1894). Showing point of puncture. A indicates fibers of the levator ani muscle. The drawing is merely diagrammatic, and the fibers of the muscle are much deeper than shown.

rare, only one case being noted in 16,000 cases of obstetrics occurring under Collins at the Rotunda Hospital. Bednar saw one case in 7154 girls in his foundling-asylum, and Winkel does not recall a single case among the 12,000 children who were under his care while director of the Dresden Hospital.

¹ Med. Rec., Feb. 10, 1894.

² Wien. med. Woch., No. 13, 1894.

³ Kansas City Med. Index, No. 5, 1894.

⁴ N. Y. Med. Jour., Aug. 11, 1894.

Buckmaster suggests the following operation: A triangular cut is made backward, the points of the triangle being the abnormal opening behind, the spot where the anus should be below—which is indicated by the anterior fibers of the pubic portion of the levator ani muscle—and the skin near the fourchet in

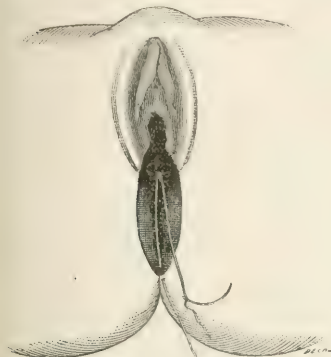


FIG. 11.—Buckmaster's operation for "vaginal anus" (N. Y. Med. Jour., Aug. 11, 1894). The rectum is to be drawn to the skin by one stitch.

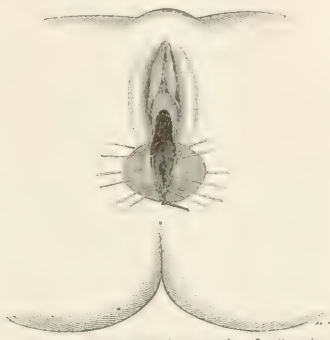


FIG. 12.—Buckmaster's operation for "vaginal anus" (N. Y. Med. Jour., Aug. 11, 1894). The stitch shown in the preceding illustration is tied, and lateral stitches have been inserted.

front. The rectum must then be drawn down to the skin and secured without strain. The raw surfaces left at the side are sewed together with stitches passed in the manner indicated by Figure 11. Figure 12 shows the first step

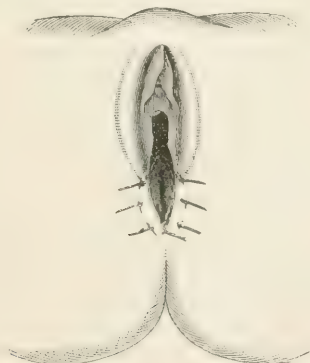


FIG. 13.—Buckmaster's operation for "vaginal anus" (N. Y. Med. Jour., Aug. 11, 1894). This shows the completion of the first operation. All raw surfaces have been united.

of the operation completed. The second step may be done at a second operation; it consists in forming the perineal body. The third step is entirely theoretic, and consists in an attempt to secure a fairly good sphincter by

splitting the fibers of the levator ani muscle as has been done with the rectus muscle in gastrostomy.

THE URINARY ORGANS.

The Bladder.—*Cystitis.*—Zuckerkandl¹ describes a form of irritable bladder in females dependent upon hyperemia or congestion, physiologic or pathologic, of the genital organs, from coition, menstruation, or pregnancy; if the exciting cause be continued, oft repeated, or pronounced, a chronic form of cystitis results. The treatment of cystitis is especially important. According to Heisler,² the urine should be rendered bland by the use of a milk diet, the ingestion of potassium citrate if the urine be acid, or of boric acid if it be alkaline. Pelvic congestion may be relieved by hot vaginal douches and the correction of constipation. The inflamed cystic mucosa may be relieved by the administration of boric acid, salol, oil of santal, copaiba, or creosote by the mouth, or by injections of boric acid, phenol, or silver nitrate in suitable strength. Rest in bed, especially in all acute cases, is absolutely imperative. In tuberculous cases, according to Rommalue, salol has no effect in destroying the bacillus, although it will prevent the growth of staphylococci in the bladder. In these cases Bardenheuer³ dissects away the entire vesical mucosa, and claims that the structure is renewed as is the endometrium after curetment. Cohen, however, claims that total excision of the mucosa is necessarily followed by contraction of the bladder and incontinence of urine, even though the epithelium be renewed over small tracts near the ureters and urethra. In gonorrheal cystitis Lutaud⁴ recommends pyoktanin in the proportion of 15 grains to 2 pints of boiled and distilled water, the injection being made morning and evening for from ten to fifteen days. Pichi, employed internally, may also be of service.

Ectropion.—Rein⁵ describes an ingenious operation for this condition. With the patient in Trendelenburg's posture, a long abdominal incision is made, the uterus and left tube and ovary are pushed aside, and a sound is introduced into the left ureter. Another sound is inserted into the rectum and the tips of the two instruments are approximated. An incision is made in the ureter at a point opposite to the tip of the sound, and also in the rectum. A glass tube is inserted into the ureter, and to it is attached a piece of rubber tubing, the other end of which is carried through the rectal opening. The corresponding openings in the ureter and rectum are then united by two layers of silk sutures. The same procedure is adopted on the right side, after which the bladder is entirely extirpated. The patient is then lowered to the dorsal posture, the vesical arteries and their branches are ligated, and the abdominal wound is closed. [It would hardly seem that this operation would come into general use.]

Urethra.—*Urethritis.*—Inflammation of the urethra in the female is

¹ Wien. med. Presse, No. 20, 1894.

² Univ. Med. Jour., No. 12, 1894.

³ Centralbl. f. Gynäk., No. 14, 1894.

⁴ Rev. Obst. et Gyn., Aug., 1894.

⁵ Centralbl. f. Gynäk., No. 17, 1894.

about synonymous with gonorrhea. Carry¹ says that, given a purulent or mucopurulent discharge from the urethra, uterine cervix, vagina, or the periurethral or vulvovaginal glands, in the vast majority of cases the disease is gonorrheal in origin. Bröse² agrees with Neisser, Bumm, Bockhard, and Wertheim, that the gonococcus is the cause of gonorrhea, but differs from Neisser and Jadassohn, who state that a catarrh is not gonorrheal unless the gonococcus can be found, and from Tait, who ascribes no importance to the gonococcus as an etiologic factor. The reason why gonococci are not found in the chronic cases, as Wertheim has pointed out, is that while young gonococci are well stained with aqueous solutions of anilin colors, old individuals are very pale and badly defined; moreover, gonococci take on "involution forms," becoming specks and granules of irregular size and form when the culture-medium becomes old. These forms are not recognizable as gonococci, yet they can be regenerated to the classical form through a fresh culture-medium. [The opinion is rapidly becoming general that the presence or absence of the gonococcus is not material to a diagnosis. For instance, in a medicolegal case it would be entirely unjustifiable, in view of our present knowledge, to pronounce a chronic case gonorrheal on the evidence of the microscope.] *Blennorrhagic preurethritis* has been described by Guérin, De Sinéty, and especially by Martineau and his students Boutin, Guédency, Lormand, and Hamonic. Verchère³ states that it is located in the small glands that have long since been described by Astruc, constituting a portion of the group of vulvar follicles. The small glands are spheric or ovular. When they become affected with gonorrhea they increase in size and consistence, and give rise to a coloration of the tissues at the glandular orifice. The course of preurethritis is slow, a collection of pus forms, and this ruptures, giving rise to a true blind fistula. A periurethral or folliculovestibular fistula may result, and Lormand has described a vestibulourethral fistula. Spontaneous cure in women, Bröse claims, is less common than in men. For acute cases he suggests vaginal douches of mercuric or zinc chlorid; urethral injections of silver nitrate (from 1 to 5 per cent.), after four weeks' energetic local treatment, and cauterization of the cervix with 50 per cent. solution of zinc chlorid on a cotton applicator. Asch⁴ considers alumnol as the most efficacious remedy against gonorrhea. For urethral injection he employs a solution of 1 or 2 parts to the 100. For a pomade he uses the following: Alumnol 7 grams, lanolin 100 grams, distilled water and glycerol each 25 grams. For cauterization of the crypts and lacunæ on either side of the meatus he uses an aqueous solution of alumnol, 10 to 20 parts to the 100, and for vesical lavage a solution of 25 parts to the 100. Montgomery⁵ recommends as a good antiseptic agent for the vagina and vulva a solution of oil of cinnamon, 1 to 500 (one drop of the oil to the ounce of distilled water). In this strength oil of cinnamon has been found to be a very

¹ Lyon méd., Jan. 14, 1894.² Am. Medico-Surg. Bul., Aug. 15, 1894.³ Ann. de Gyn. et d'Obstet., Feb., 1894.⁴ Gaz. des Hôp., July 12, 1894.⁵ Therap. Gaz., Aug. 15, 1894.

effective germicide. D. B. Kyle's theory is that, like all volatile oils, it coagulates or contracts the protoplasmic envelope of the germ, and thus imprisons it in its contracted shell, rendering it inert. Acetanilid, also, is coming into favor as an antiseptic agent. Its remarkable power as a preventive of pus-formation, as first noted by Harrell and Bodamer, has been further demonstrated by T. S. K. Morton,¹ who has employed it in over one thousand surgical cases. The action of acetanilid upon wounds, especially granulations, when used in full strength, is to produce intense dryness and blueness, and to check at once and prevent the ultimate formation of pus. If used in sufficient quantity, a thin scab of acetanilid combined with the wound-secretions forms, under which healing rapidly progresses. If a very large surface be exposed to the action of the undiluted drug, toxic symptoms promptly supervene in susceptible individuals. Morton has employed the pure powder, but regards this as an unnecessary waste, as he has found that a $\frac{1}{2}$ of 1 per cent. mixture with petrolatum is sufficient to arrest suppuration and promote healing. Acetanilid will dissolve in liquid petrolatum to the extent of 40 grains to the ounce.

Its action is probably due to its noxious effect upon the bacteria of the skin, rendering the latter sterile.

In giving vaginal douches Bozeman² has devised an apparatus by which, through the agency of an automatic outflow, the soiling of the patient's clothing and bedding may be avoided. A soft-rubber bag is employed as the reservoir, and the outflow is not constant; it is four ounces per minute at the beginning, and it gradually diminishes. The bag holds two quarts of water, which runs out in twenty minutes. The apparatus commends itself for its compactness, and it certainly minimizes the quantity of hot water required for a protracted douche, which is a great comfort to patients who have not the advantages of a home or of hospital appointments. When in use the bag is suspended by the side of the bed three feet from the floor, directly over some form of receptacle. The perforated loop of soft-rubber tubing is compressed when introduced into the vagina. On opening the stopcock the

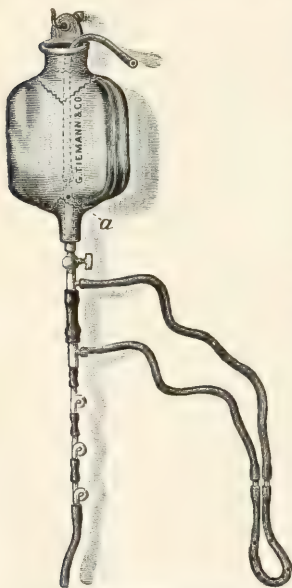


FIG. 14. — Bozeman's new vaginal douche (N. Y. Med. Jour., Sept. 29, 1894).

upper or inflow tube is clamped for a few seconds while the outflow tube is being exhausted of air; when it is released a continuous flow of air and water

¹ Phila. Polyclinic, Feb. 16, 1895.

² N. Y. Med. Jour., Sept. 29, 1894.

takes place into the vagina; the water accumulates there to the level of the uppermost perforations in the bent tube, and is then carried off into the vessel on the floor. If it is necessary to continue the douche longer than twenty minutes, a pitcher of hot water is placed near at hand, so that the patient can herself replenish the douche-bag without rising when it becomes empty.

Stricture of the Urethra.—This is a very rare condition in the female, but Kleinwächter¹ reports three new cases, one in a woman of fifty-three years, and another in a woman of fifty-six. The third followed injury of the urethra during childbirth. He admits that gonorrhea is undoubtedly the most frequent cause of this condition.

Urethral Incontinence of Urine.—[While in some of the cases of urethral incontinence Brandt's method of massage may result in a partial or even complete cure, the vast majority of cases require for their relief some form of operative procedure.] Gersuny's² operation consists in freeing the anterior portion of the urethral mucosa from the surrounding parts by an incision, twisting it more or less, and fixing it in its twisted condition by means of sutures. Von Frisch thinks that the good effects of this operation will be but temporary. Frank³ recommends the following method: The anterior vaginal wall is incised from a point just opposite the beginning of the urethra as high as the portio, and the posterior wall of the bladder is dissected away. A fold is turned into the bladder, so as to form a valve over the vesical opening, and this is secured with catgut sutures.

Urethral Fistula.—For this condition Schultze⁴ makes a denudation in the shape of a horseshoe extending as high as the neck of the bladder and including the fistula, and unites the apposed surfaces with numerous sutures of silkworm-gut.

Urethral Prolapse.—This is also a rare condition, but Bryant⁵ reports a case of extreme prolapse in a girl of six years. The prolapsed mucosa formed a mass measuring about three-quarters of an inch in diameter and the same in height. This was reduced under the influence of chloroform.

Carcinoma.—Webster⁶ employs injections of 20 drops of a mixture of equal parts of phenol and glycerol combined with 80 drops of water. There is little pain attending this plan of treatment, he claims, and but little inflammatory action will follow the introduction of the remedy.

Ureters.—*Ureteritis.*—By far the most exhaustive article on inflammation of the ureters for the past year is that by Mann⁷ of Buffalo. From his experience he is convinced that inflammation and irritation of these organs are exceedingly common. He recognizes seven causes of this disease—namely, injuries during childbirth, previous disease of the bladder, gonorrhea, suppuration of the pelvis of the kidney, pelvic disease such as pelvic peritonitis, cellulitis, and tumors, abnormal conditions of the urine, and tuberculosis. He

¹ Zeitsch. f. Geburtsh. u. Gynäk., vol. xxviii. pt. i., 1894.

² N. Y. Med. Jour., June 2, 1894.

³ Ibid., No. 17, 1894.

⁶ Mass. Med. Jour., March, 1894.

³ Centralbl. f. Gynäk., No. 16, 1894.

⁵ Brit. Med. Jour., May 12, 1894.

⁷ Am. Jour. Med. Sci., Aug., 1894.

distinguishes several forms or stages of the disease. The first is the catarrhal form, in which there is a little swelling of the tubes with desquamation of the epithelial lining. In other cases the surface of the tubes seems to give forth a plentiful purulent secretion, indicating an ulcerated or granulating condition of their lining membranes. Tourneur says that when these ulcerations occur a thickening in the surrounding connective tissue takes place, with, perhaps, adhesions of the peritoneum, giving an irregular outline to the course of the ureters. Sometimes the tube is greatly thickened by inflammatory deposits in the walls, so that they become as large as a lead-pencil or larger. In case of obstruction, dilation even to an extreme degree may take place. The pelvis of the kidney is doubtless generally more or less involved together with the ureters. Generally the left ureter is much more seriously affected than the other. The most constant symptom is frequent micturition, which may even become continuous, and there is pain over the ureters, one or both—more commonly the left. This is burning or boring in character, aggravated by menstruation. Absolute distaste for water may be noted. The diagnosis must be made mainly on the physical examination. The ureters may be palpated in the pelvis or through the abdominal wall. Catheterization of the ureters will also be of service. Constitutional treatment is essential, and consists in perfect hygiene, limited diet, Turkish baths, massage, the free use of water, and the use of alkalies, such as the liquor potassæ in 5-drop doses, sodium bicarbonate, Rochelle salts, and potassium acetate and citrate. Constipation must be corrected and anemia treated. Sandal-wood and copaiba are of service; also the essence of



FIG. 15.—Kelly's method of cystoscopy: hips in moderate elevation for cystoscopic examination and direct catheterization of ureters (Am. Jour. Obstet., No. 1, 1894).

turpentine. Direct local treatment, as suggested by Howard Kelly,¹ is absolutely essential. This is accomplished by means of direct examination of the bladder. The organ is first emptied as completely as possible by the

¹ Am. Jour. Obstet., No. 1, 1894.

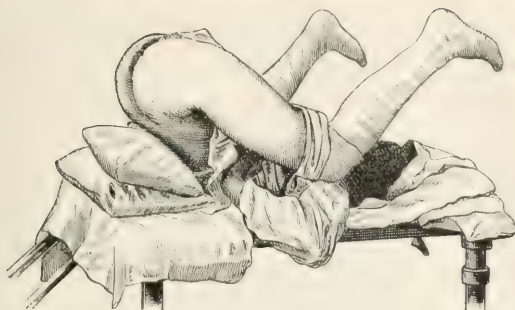


FIG. 16.—Kelly's method of cystoscopy: hips in extreme elevation for cystoscopic examination and direct catheterization of ureter (*Am. Jour. of Obst.*, No. 1, 1894).

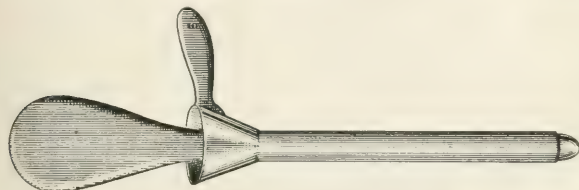


FIG. 17.—Speculum, two-thirds natural size (*ibid.*).

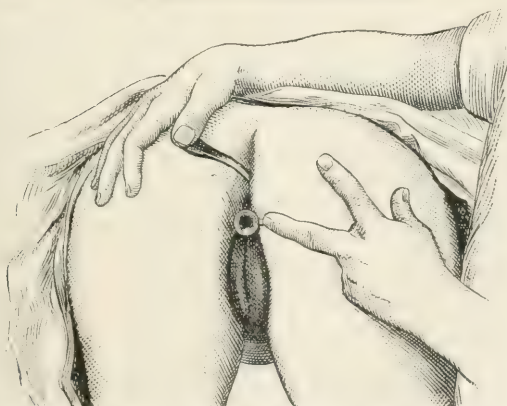


FIG. 18.—Kelly's method of cystoscopy: cystoscopy in genupectoral posture: speculum introduced into bladder: dilator under right thumb indicates position of anus (*ibid.*).

catheter; the urethra is then dilated by means of a specially devised calibrator, a dilatation of from 12 to 14 millimeters being sufficient. The hips of the patient are then elevated on cushions from 20 to 40 centimeters above the level of the table, and a speculum corresponding to the degree

of urethral dilatation is introduced, when the bladder becomes distended with air. The rays of an electric head-light are then directed through the speculum and the interior of the bladder is illuminated. The ureteral orifices may now be detected and the ureters catheterized if so desired.

MENSTRUATION AND ITS DISORDERS.

Etiology of Menstruation.—There has recently been manifested a revival of interest in the vexed problem of the causation of menstruation, largely due to the efforts of Christopher Martin,¹ who has suggested the nerve-theory of the phenomenon. He argues that menstruation is a process directly controlled by a special automatic nerve-center, probably located in the lumbar enlargement of the spinal cord, which, as is well recognized, is intimately associated with all of the pelvic functions, containing as it does the centers for micturition, defecation, erection, ejaculation, and, as has been demonstrated by experiments upon animals, the center governing the act of parturition. If the parturition-center be located here, the natural inference is that the menstrual center cannot be far away. This center is supposed to control all of the nerve-ganglia found in the pelvis, those in the uterine substance, in the nerve-plexuses at the side of the uterus between the layers of the broad ligaments, and the cervical ganglion of the uterus. The changes in the uterine mucosa during the menstrual epoch are induced by katabolic nerves, and those occurring during the intervals by anabolic nerves, the menstrual impulses reaching the uterus either through the pelvic splanchnics or the ovarian plexus, or both. When these menstrual nerves are severed, as on removal of the uterine appendages, menstruation ceases. In this connection the microscopic investigations of Gawronsky² as to the ultimate termination of the nerves in the female genitalia are interesting. He finds that there are two sets of nerve-fibers in the uterus, one set being distributed throughout the muscular layer without anastomosing, and terminating in multipolar ganglion-cells in the submucosa. From these cells spring filaments that enter the mucosa and terminate either in the epithelial cells or in terminal bulbs. The other set, which also traverses the muscular layers, ends directly in the epithelial cells and glands. In the Fallopian tube the nerve-fibers interlace freely and give off numerous filaments that terminate in points or bulbs just beneath the epithelial layer. In the ovary, bundles of nerves can be demonstrated in the parenchymatous zone that do not communicate with one another. In some preparations delicate branches can be traced to the follicle, where they end in the theca folliculi or enter the latter after a more or less circuitous course. Frequently fibers are seen that end in terminal bulbs in the membrana granulosa. Fibrils have occasionally been traced through the membrana granulosa to the immediate neighborhood of the ovum, although it is impossible to determine their exact and ultimate termination. Mandl³ is of the opinion that the majority of the nerves in the

¹ British Gyn. Jour., Nov., 1893.

² Centralbl. f. Gynäk., No. 11, 1894.

³ Archiv f. Gynäk., Band xlviii, Heft 2.

ovary are distributed to the blood-vessels. Riese believes that some of the nerves, especially those ending in the capillaries, are sensory, and Mandl holds that the same is true of those fibers that radiate through the cortical zone, and can be traced to the germinal epithelium, as well as those that run parallel to the surface of the ovary just beneath the superficial epithelium. In the vagina the nerves in the muscular coat show many sharp curves. At these points lateral branches are sent off that follow the same course as in the muscular layer of the uterus. The fibers change their course after entering the submucosa, form flexures, and reach the epithelial surface and terminate in points or bulbs in the deeper layer of epithelium.

The *cervical ganglion* of the uterus, as to the existence of which there has been so much discussion, has been carefully studied by Byron Robinson,¹ who concludes that it is as much a veritable ganglion as is the superior cervical ganglion. It is best exposed by opening the abdomen of an infant cadaver and removing the hip-bone by disarticulating at the sacroiliac synchondrosis, severing at the tip of the ischial spine, and sawing through the pubic rami at the center of the obturator foramen; the hypogastric plexus is next located just beneath the peritoneum at the sacral promontory, and the roots of the first four sacral nerves are exposed and their branches traced toward the cervix; the lower end of the hypogastric plexus and the sacral branches converge near the cervix into a mass of white tissue, the ganglion of the cervix uteri, which, though varying in shape and size, is constant, and supplies numerous branches to the uterus, bladder, vagina, and rectum. Its fellow lies upon the opposite side of the cervix. After the menopause these ganglia undergo more or less diminution in size.

Collins² modifies the nerve-theory of menstruation as just stated by suggesting that uterine hemorrhage, menstrual or metrorrhagic, is invariably caused by intrauterine irritation acting reflexly through a reflex nervous center, which he terms the uteroovarian center, believed to consist of two parts—a visceromotor, intermittent in action, controlling uterine muscular contractions, and a vasoconstrictor, which is in constant activity, and is only inhibited by the arrival from the uterus of afferent inhibitory impulses at the center. This center he locates in the lumbar cord. The prime cause of the intrauterine irritation is probably the presence of decaying decidua cells. [We cannot see that either theory adds materially to our knowledge of the subject.]

During menstruation Herman³ has by actual measurements demonstrated that there occurs a slight spontaneous dilatation of the cervical canal that reaches its maximum on the third and fourth days, occurring as well in those who suffer with dysmenorrhea as in those who are free from it, and unaffected by menorrhagia or by scanty menstruation.

Chlorosis and Amenorrhea.—The dyspeptic disturbances that are so characteristic of chlorosis depend, according to Osswald,⁴ not upon any de-

¹ Med. Rec., Sept. 29, 1894.

² Am. Gyn. and Obst. Jour., Feb., 1895.

³ Ibid., Dec., 1894.

⁴ Münch. med. Woch., July 3 and 10, 1894.

fiency in the quantity of hydrochloric acid in the gastric juice, as is commonly believed, nor upon a motor insufficiency of the stomach; indeed, there is a very material increase in the quantity of acid present, hydrochloric hyperacidity existing in 95 per cent. of the cases. The routine administration of hydrochloric acid in each and every case of chlorosis is, therefore, to be deprecated. In explanation of the common tendency of chlorotics to an accumulation of fat, Carl von Noorden¹ formulates the statement that patients suffering from chlorosis are inclined to amass fat, for the reasons that, on the one hand, they are inclined to diminish the expenditure for work and heat, and, on the other hand, they do not diminish the supply of food correspondingly, but rather in many cases surpass the average measure. To counteract this disproportion between food-assimilation and tissue-metabolism the suggestion is that young chlorotic girls, originally lean or who have become so in the course of their sickness, should ingest food copious in quantity and favoring the deposit of adipose tissue, including large quantities of fats and amylaceous foods, and not more than eighty grams of albuminous bodies a day; at the same time unnecessary muscular exertion and loss of heat should be avoided. Stout chlorotics, on the other hand, should take at least one hundred and twenty grams of albumin daily; in addition they must be allowed fat and carbohydrates so that the total nutritive value of the food does not exceed thirty-six calories per kilo of body-weight. Moderate exercise in the fresh air is imperative, and this should be gradually increased without corresponding increase in the quantity of food ingested. To correct the amenorrhea that is present, tincture of *senecio vulgaris*² in 1- or 2-fluidram doses thrice daily, or the fluid extract in 20-drop doses, may be administered, or oxalic acid in combination with iron and manganese peptonates;³ in employing the latter preparation the toxic action of the oxalic acid, as pointed out by Talley,⁴ must be borne in mind. *Senecio vulgaris*, in addition, shows a tendency to correct the dysmenorrhea and the headache attending the menstruation, as will also, in plethoric cases, premenstrual venesection to the amount of eight or ten ounces.⁵ Murrel⁶ finds that the action of the fluid extract of *senecio jacobæ* is analogous to that of potassium permanganate. It is especially indicated in functional amenorrhea. The drug not only makes the appearance of the menses regular, but also increases the amount of the flow.

Menorrhagia and Metrorrhagia.—The classification of the etiology of menorrhagia as suggested by Noble⁷ is a concise account of the subject. He groups it according to the age of the patient, as follows:

1. Menorrhagia in young virgins is usually functional, due to disturbances in the vasomotor nervous system or to relaxation of the tissues, and in general it is caused by the rapid growth that usually takes place about the

¹ Internat. Med. Mag., May, 1894.

² Bloom, Med. News, Sept. 29, 1894.

³ R. J. E. Young, Edin. Med. Jour., Sept., 1894.

² Murrel, La Sém. méd., No. 14, 1894.

⁴ Med. News, Jan. 6, 1894.

⁶ Therap. Gaz., June 15, 1895.

⁷ Am. Medico-Surg. Bull., Aug. 1, 1894.

time of puberty. Because of its pathology menorrhagia in young virgins is usually curable by general treatment.

2. Menorrhagia occurring in young child-bearing women is usually due to some mishap in connection with pregnancy or parturition, such as the retention of products of conception, laceration of the cervix or perineum, retrodisplacement of the uterus, subinvolution, inflammation of the uterine appendages, and pelvic congestion. Menorrhagia in this class of women is curable. It usually requires local treatment of an operative nature. When due to subinvolution and malpositions of the womb, operation is unnecessary.

3. Menorrhagia in women approaching forty years of age and in those who are older is often due to gross diseases of the uterus, such as fibroid tumors, polypi, adenomata, or malignant tumors. Menorrhagia occurring in this class of women, except when due to advanced malignant disease, is curable, but almost invariably requires operative treatment applicable to the disease present in the particular case.

In the treatment of the excessive flow Zurhelle¹ advises the administration of salipyrin in 15-grain doses thrice daily. Kallmorgen² has had excellent results from the use of hydrastinin, an alkaloid obtained from the oxidation of hydrastin, in doses of from $\frac{1}{2}$ to 1 grain three times daily. The best results were obtained in the cases of hemorrhage following hematocoele (100 per cent. cured); in simple menorrhagia, 85 per cent.; in hemorrhage after abortion, 83 per cent.; and in the hemorrhage depending upon disorders of the tubes and ovaries, 75 per cent.

Dysmenorrhea.—In the treatment of dysmenorrhea occurring in young chlorotics, Schwarze,³ in addition to the usual tonic remedies, recommends the employment of the more recent antineuralgics—antipyrin, phenacetin, antifebrin, exalgin, and sodium salicylate. He suggests that in the treatment of this class of cases there exist two agents that are not sufficiently appreciated. The first of these is the gymnastic, mechanic treatment of the disease introduced by Thure-Brandt, and which is applicable to noninflammatory cases. The movements recommended by Thure-Brandt are: 1. Percussion of the loins; 2. Rolling of the thigh; 3. With the patient in a standing position the knees are bent and stretched against her opposition; 4. Rolling of the feet; 5. Separating the knees and leaning backward. The movements are performed at home, if possible daily—at any rate daily for one week before menstruation. Schwarze asserts that patients who dance or ride horseback some days before menstruation have much less pain or none at all. But in well-developed, not anemic women, who suffer violently from dysmenorrhea, special gymnastics are not to the purpose. Here in non-inflammatory cases viburnum prunifolium gives brilliant results that are not to be obtained with any other remedy except morphin. Schwarze gives a teaspoonful of the fluid extract three times daily, beginning from five to seven days before menstruation. He is opposed to local massage in the dys-

¹ Am. Medico-Surg. Bull., July, 1894.

² Canad. Pract., July, 1894.

³ Therap. Monatshefte, May, 1894.

menorrhœa of maidens, but thinks it is a powerful aid in sterile women. The simplest local measure is the introduction of a sound into the uterine cavity shortly before menstruation. In cases in which introduction of a sound gives only transient improvement, cure is not often obtained with bougies. Dilation is best performed several days in succession a short time before menstruation. Electricity he always recommends in severe cases before dilatation. The most satisfactory way is with the galvanic current, with the negative pole, an aluminum sound, introduced into the uterus, and the positive pole, in the form of a flat electrode as large as possible, laid upon the abdomen. A current-strength of from 50 to 150 ma. is employed. In cases that resist all treatment for years castration is indicated. It may be, however, that the nervous disturbances have reached so high a degree that reparation will not occur. In other cases the dysmenorrhœa is only one manifestation of a neuropathic condition.

Brunnberg has treated 24 cases of severe dysmenorrhœa with hypnotism, curing 14 and improving 7.

Lutaud¹ goes further and offers a treatment in accord with the etiology of the disease. In the *congestive* or *inflammatory* variety he prescribes citrate of iron and quinin 1 gram ($15\frac{1}{2}$ grains), alcohol (90 per cent.) 10 grams ($2\frac{1}{2}$ fluidrams), water 190 grams (6 fluidounces); of this one teaspoonful is administered before meals in water or white wine during the intermenstrual period. During the period sodium salicylate and analgesin, of each 0.15 gram ($\frac{1}{4}$ grain), are given every two hours, alternated with tincture of viburnum prunifolium 2 grams (31 minims), elixir of Garus 30 grams (1 fluidounce), syrup of peppermint 15 grams ($3\frac{3}{4}$ fluidrams), distilled water 100 grams ($3\frac{1}{4}$ fluidounces), a teaspoonful being given at a dose. If the pain is intense, and associated with excitement and insomnia, he gives at bedtime chloral hydrate and strontium bromid, each 6 grams ($1\frac{1}{2}$ drams), tincture of cannabis indica 15 drops, syrup of orange-peel 60 grams ($1\frac{3}{4}$ fluidounces); the dose is a tablespoonful in a little water, repeated once during the night if required. If the stomach is fatigued, an injection of chloral hydrate 4 grams (1 dram) and water 200 grams ($6\frac{1}{2}$ fluidounces) is employed. Opium is not to be employed in women with a tendency to constipation, as it increases tympanites and dyspeptic symptoms. If absolutely necessary, he uses the following injection at night three hours after the last meal: Sydenham's laudanum 20 drops, pulverized camphor 0.20 gram ($3\frac{1}{4}$ grains), the yelk of one egg, water 200 grams ($6\frac{1}{2}$ fluidounces). In the *membranous* variety the foregoing injection may be given each evening, or tincture of asafetida 5 grams ($1\frac{1}{4}$ fluidrams), tincture of belladonna 20 drops, Sydenham's laudanum 10 drops, lukewarm water 100 grams ($3\frac{1}{4}$ fluidounces). Every four hours until the flow appears a vaginal injection may be given containing water at 45° C. (113° F.) 2 liters (quarts), and essence of thyme 20 drops.

The Menopause.—A complicated climacteric is invariably indicative of a pathologic state of the genitalia, and Feltz suggests as the three most fre-

¹ N. Am. Pract., May, 1894.

quent causes of the trouble, rupture of the perineum, laceration of the cervix with or without ulceration, and epithelioma. The disorders of the nervous system associated with the change of life are functional in character, and, according to Eliot,¹ are associated with disturbances of the functions of other organs, especially of the digestive, circulatory, and hematopoietic systems. The treatment must necessarily be mainly hygienic, and will consist in regulation of the diet and of the alimentary canal, in combating the tendency to sleep and sloth, and in the adoption of a moderate amount of exercise.

UTERINE DISPLACEMENTS.

Retroflexion.—[Many of the so-called instances of adherent retroflexions are, as a matter of fact, simply held in Douglas's pouch by a combination of atmospheric pressure, the intestines, and the two layers of the uterosacral ligaments that imprison the uterus laterally.] Rapin's² method of reducing such displacements is by the introduction of the sound with the usual anterior rotation; if the position remain unchanged, instead of lowering the handle of the sound the latter is pressed from behind forward and from below upward, moving the uterus as with a lever; the entire anterior face of the uterine cavity is thus pressed upon, and the uterus is carried forward and upward without being first replaced. The fundus is thus dislodged from the rectum, and the intestines, falling into the culdesac, aid in the forward movement of the organ. The handle of the sound may now be lowered, when the fundus will be replaced without any exertion of force and without the provocation of pain. [The method, it will be noted, is simply a modification of the old method of replacing a displaced uterus with the uterine sound. It is a method that time and experience have condemned as unnecessary, painful, and dangerous, especially so should a mistake in diagnosis be made and adhesions be found to exist. The method is little used since such sure and safe ones have been found either in the bimanual or the knee-chest methods.] Kellogg's maxims that displacement of the pelvic viscera is not, as a rule, an isolated pathologic condition, but is associated with similar static disturbances of the viscera of the abdominal cavity, and that the principal causes of uterine and ovarian displacements are such as affect the static relations of the viscera of the abdomen as well as those of the pelvis—hence the rational treatment of pelvic displacements requires the removal of all causes of displacement of the abdominal as well as of the pelvic viscera, and the restoration of the normal supports of these organs—must be borne in mind in the correction of these conditions. [In the matter of radical treatment of retrodisplacement Mackenrodt's operation of vaginofixation has attracted an unusual amount of attention, but it will, we think, probably be as short-lived as its immediate predecessor devised by Schücking. Abdominal hysteropexy, with its various modifications, is rapidly and deservedly attaining general favor with the profession.] The technic

¹ Brooklyn Med. Jour., July, 1894.

² Rev. Méd.-Chir. des Maladies des Femmes, May, 1894.

and indications of vaginofixation as set down by Vineberg¹ are as follows: The patient is prepared as for vaginal hysterectomy. The uterus is curetted and any existing cervical laceration repaired. The cervix is then grasped by two volsellæ and drawn downward and outward. The anterior vaginal wall is caught by another volsella at a point from one to two centimeters below the urethral orifice and drawn upward, thus placing the vaginal wall on the stretch. A sound is passed into the bladder to ascertain the extent of vesical adherence and to estimate the thickness of the vaginal wall. With a sharp convex-bladed knife a longitudinal incision is made in the median line through the anterior vaginal wall, extending from one to two centimeters below the urethral orifice to the vaginal attachment of the cervix. The two flaps thus formed are separated from the underlying bladder, any hemorrhage being arrested as it occurs. The width of the flaps is made to depend upon the degree of prolapse or relaxation of the anterior wall, but are wider near the cervix and gradually taper toward the upper angle of the incision. The two flaps are now held apart by tenacula at the lower angle of the wound, and a transverse, slightly curved incision is made upon the cervical tissue in the already denuded surface, cutting through the septum binding the bladder to the cervix. The bladder is next gently pushed up from the cervix and wall of the uterus with the palmar surface of the index finger, as is done in vaginal hysterectomy. In some cases, to facilitate this step, it may be necessary to nip with the scissors the attachment of the bladder to the broad ligaments at either side, making a good, free separation of the bladder from the uterus, and displacing it behind the pubes, where it can be retained, if necessary, by a vaginal depressor.

In the majority of cases of retroflexion there is a prolapse of the anterior vaginal wall, and even when there is no prolapse there is usually relaxation to a lesser or greater degree. Consequently, in nearly all cases an anterior kolporrhaphy is indicated. In vaginofixation this serves two purposes—to restore the width of the canal to its original dimensions, and to form a better fixed point for the fixation of the uterus. The kolporrhaphy is now easily carried out by resecting a corresponding strip of tissue from either vaginal flap. The next step of the operation consists in anteverting the uterus with a properly constructed sound, so that its body presents in the vaginal wound. It is of importance to have the right kind of a sound. In some cases the uterus is readily anteverted; in others, again, considerable difficulty is experienced, owing to the small arc through which the sound can pass on account of a high and rigid perineum; hence the value of the curve at the lower end of the sound. In virgins and nulliparæ it might be necessary to incise the perineum so as to gain more room. Having drawn the uterus well forward and presenting in the vaginal incision, it is sutured to the vaginal wall. With a moderately stout curved needle a silk suture is passed through the left vaginal flap at the extreme upper end of the incision—that is, from one to two centimeters below the urethral

¹ N. Y. Med. Jour., Oct. 27, 1894.

opening and about half a centimeter from the edge of the flap. The suture is then carried through the anterior wall of the uterus, as near the fundus as possible, and out through the right flap at a corresponding point to that of the opposite side. A second suture is passed in the same way about a centimeter below the first. The sutures are now tied and the vaginal wound is closed by a continuous catgut suture, the last one or two stitches being made to catch up the cervical tissue to avoid any pocketing. A couple of interrupted sutures may be passed to strengthen the line of coaptation, particularly if any tension exists. Should there be a prolapse of the posterior vaginal wall or a laceration of the perineum, this is now attended to. The vagina is packed lightly with iodoform-gauze and the patient put to bed for three weeks, the uterine sutures being removed at the end of the fifth or sixth week.

This operation, which fixes the uterus in a position closely resembling the normal, is indicated, according to Mackenrodt, in mobile retroversions or retroflexions that are attended with symptoms, and which are for various reasons unsuited for treatment by pessaries or tampons. Pestalloza¹ limits the operation to cases in which uteri in retroflexion are reducible; in cases with adhesions he prefers abdominal hysteropexy and shortening of the round ligaments by vaginal fixation.

[The description of the foregoing operation carries with it its own condemnation, both as to what would be expected in the result and as showing a complete misconception of uterine displacements. Displacements never give rise in virginal women to symptoms unless complicated by inflammation; hence the folly of such procedures as these. The method of suturing is so faulty that one would naturally expect to find such uteri returning to their displaced condition. Such, as a matter of fact, has been the case in the few patients who have passed through our hands upon whom this operation had been performed. Like all other operations for displacement that do not open the abdominal cavity, it takes no account of possibly existing adhesions, upon the absence or presence of which the success of any such operation must necessarily depend.]

[Ventrofixation may be extraperitoneal or intraperitoneal. The extraperitoneal method is to be condemned without regard to the manner of introducing the sutures—whether they are brought through the vagina or through the abdominal parietes. The practical objections that pertain to these procedures are the possibility of adhesions, inflammation about the appendages, and injury to the bladder and intestines. Intraperitoneal operations comprise two great classes: One is indirect, aiming at fixing the uterus through operation on the ligaments; the other direct, requiring direct uterine fixation. Of the latter class there are two varieties, lateral fixation and direct median fixation. In lateral fixation the sutures are introduced on each side, away from the fundus uteri, but on a level with its lateral border. There is in this operation some danger of wounding the epigastric

¹ *Nouvelles Arch. d'Obst. et de Gynéc.*, May 25, 1894.

artery and Fallopian tube; the anterior serous fold may also be included in the ligature. The sutures cannot give a very good hold upon the uterus, and the strain on the upper suture must be considerable. There is also left between the uterus and the abdominal wall an aperture that might permit subsequent intestinal strangulation. The operation of direct median fixation of the uterus is unquestionably the simplest and most secure method.] Napier's¹ operation is described as follows: 1. Opening of the abdomen in the usual manner. 2. The introduction of two fingers and the freeing of any adhesions, either by fingers or by fingers and a sponge on a holder. 3. Supporting of the uterus with fingers or sponge, passing a suture (chromicized catgut, No. 3 or No. 2, or median silk) through the fundus uteri, entering the wall pretty deeply, and by means of this suture dragging the freed uterus upward. Two other sutures of chromic catgut are now introduced through the deeper abdominal layer and *the front* of the uterus, one as low down on the corpus uteri as possible, the second midway between the upper and lower sutures; neither of these is tied till later. The sutures pass only through the edge of the rectus, but take a firm hold of the serous and fibrous structures. The divided parietal peritoneum below the level of the lowest suture is united with the ordinary deep abdominal silkworm-gut suture. The abdominal sutures immediately in front of the uterus pass through skin and superficial fascia, and preferably take a slight hold upon the muscle-layer. The upper uterine thread is now passed through each side of the abdominal wall from within outward, embracing the serous, the fibrous, and the edges of the muscular layers, and is tied; then the middle, and next the lowest thread, is secured. The peritoneum is carefully sponged. 4. The abdominal sutures are now tied; these should be closely placed and care taken in approximating the skin in order to obtain union by first intention. Strapping is applied with dry gauze dressings, pads, and a many-tailed bandage.

[Czempin's² method of ventrofixation without opening of the abdominal cavity is essentially the same as Krug's "transperitoneal hysterorrhaphy" described by him several years ago.] The steps of the operation are as follows: The uterine cavity is first cureted with the patient in the dorsal position. The uterus is then replaced manually or with a sound, adhesions being separated. A silk suture is passed through the cervix, is tied, and the ends are attached to a small ring on the anterior surface of the sound, which is thus held in position. The patient is then placed in Trendelenburg's posture, and a small incision made in the median line just above the symphysis, exposing the peritoneum. The fundus uteri being held in contact with the abdominal wall, a large curved needle carrying a silk thread is passed through the edge of the wound into the muscular substance of the uterus at a point near the right cornu, in front of the origin of the tube. It is brought out at about the middle of the fundus, is reentered nearly at the same point, and (while an assistant tilts the uterus so as to bring its left horn beneath

¹ Brit. Med. Jour., Aug. 2, 1893.

² Centralbl. f. Gynäk., Sept. 1, 1894.

the peritoneum at the bottom of the wound) traverses the muscular substance of the organ, emerging from it behind the origin of the left tube, and thence through the edge of the external wound at a point an inch higher up than the opposite point of entrance. A similar suture is introduced, forming a cross with the first at the top of the fundus. The ends of the sutures are secured with clamps, and the sound is withdrawn from the uterus, which sinks downward a little. The abdominal wound is then closed, a strip of iodoform-gauze being inserted in the lower angle for a couple of days. The fixation-sutures are now tied each with its fellow on the same side of the incision. The operation does not exceed half an hour, and no blood is lost. All the sutures are removed on the tenth day, and the patient is ready to be discharged two days later, without a pessary or other support. The eleven cases in which this operation was performed were successful, the uterus remaining anteverted and movable after the lapse of several months. [This method cannot be recommended.]

Braithwaite¹ modifies the operation of ventrofixation as follows: The central incision in the abdominal wall is made, as usual, low down, and with its lower end not more than an inch, or even less, above the pubes; but the peritoneum itself is cut through in the upper half of the incision only; in the lower half it is left intact, with as much fascia and cellular tissue as possible, the muscles, however, being drawn aside. Two fingers of the left hand are then passed in, and the uterus is pulled up to, and held firmly in contact with, the uncut peritoneum exposed in the lower half of the wound. The fundus is then just visible above the edge of the peritoneum. The anterior surface of the uterus is now fastened to the peritoneum by silkworm-gut sutures. This plan of operating, he claims, has several advantages. Two sutures can be placed from above downward at the extreme edges of the anterior surface of the uterus, in addition to the usual transverse ones. This ensures a more complete and extensive coaptation of the peritoneum. It also does away with the objection that the adhesion produced elongates, so that soon the uterus is merely suspended by a band.

[The method recommended by Napier is by far the best of these procedures, especially if silkworm-gut sutures be substituted for catgut. Contrary to what might be expected, permanent bladder-troubles are quite the exception after ventrofixation, and these discomforts are almost certainly avoidable by care in operating. Pregnancy also has followed the operation without any untoward symptoms or interruption of its course.]

Alexander's operation, while rapidly growing obsolescent, still has a few adherents, among whom may be mentioned Dr. Mundé. In the past ten years he² has performed the operation sixty-five times. He says that if the ligaments are not found it is always the fault of the operator, for by proper attention to the spine of the pubis and the external ring they can invariably be detected. The operation is indicated only where there is a sharply retroverted or retroflexed uterus with more or less descent and relaxation of all

¹ Brit. Med. Jour., May 19, 1894.

² Am. Medico-Surg. Jour., July 1, 1894.

the soft parts and perfect mobility of the uterus and adnexa. [In a very great number of cases this is a series of conditions which it is wellnigh impossible to determine prior to opening the abdomen. For this reason Alexander's operation has an exceeding limited place in gynecologic surgery.]

Mann,¹ finding objections to Alexander's operation and also to suspensio uteri—to the latter because it seems to him to induce an unphysiologic condition—suggests the following method of intraabdominal shortening of the round ligaments for retrodisplacements of the uterus: A moderate-sized opening is made in the abdominal wall, and any adhesions that bind down the uterus are broken up, and diseases of the tubes or ovaries that may demand attention are properly treated, either by the conservative method or by removal of the diseased organs. The patient is then placed in the Trendelenburg posture, a large, flat sponge spread over the intestines, and the uterus pulled up as near the abdominal wound as possible. By pulling the uterus to one side the round ligament on the opposite side is put more or less upon the stretch and made distinctly visible. The ligament is then seized with two long-handled hemostatic forceps, the points of seizure dividing the ligament as nearly as possible into three equal portions. A little lapping over of the parts and comparing will tell whether the division is equal or not. The next step consists in passing a needle threaded with silkworm-gut through the loop nearest to the abdominal wall, the needle being then made to pass under the point where the round ligament is inserted into the uterus, a considerable quantity of uterine tissue being included in the suture. The hemostatic is then removed and the loop of ligament tied to the uterus. It is necessary when the ligature is first pulled that it should not be drawn too tightly; but the second half of the knot should be tied as tightly as possible in order to prevent slipping. The ordinary square knot is the one used. The ends of the silkworm-gut are cut off quite close to the

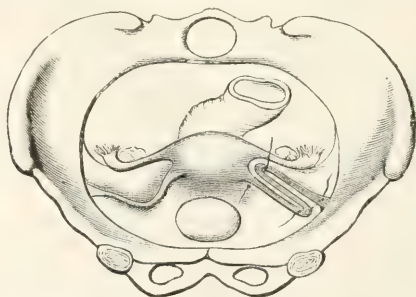


FIG. 19.—Mann's method of shortening the round ligament (Med. News, March 23, 1895).

knot. A second stitch is passed through the ligament just as it leaves the abdominal wall, and then through the loop in that portion of the ligament

¹ Med. News, March 23, 1895.

nearest to the uterus. The ligature is tied and cut as before. In this way the ligament is doubled on itself twice, and three thicknesses of round ligament are stretched between the sides of the pelvis and the front wall of the uterus. The same steps being taken on the opposite side, the wound is closed as usual. Reference to the illustration will make the description clear (Fig. 19).

Anteflexion.—Worthy of mention in the management of extreme anterior displacements of the uterus is Holmes's¹ suggestion of ventrofixation in order to remove the pressure of the displaced uterus from the bladder, and thereby alleviate the distressing vesical symptoms. In cases of dysmenorrhea due to anteflexion he would perform the fixation with a hope that in some cases the procedure may measurably relieve the dysmenorrhea in the following manner: The body of the uterus being fixed, the weight of the bladder and vagina would tend to alter the direction of the uterine canal, so that the menstrual flow would meet with less obstruction. The best results in such cases could follow only when, the tenaculum applied to the cervix by moderate traction, the uterine canal could be changed to the extent of permitting the ready introduction of a sound. Six cases operated upon by Dr. Holmes by this method have been materially improved.

[Hysterorrhaphy in this class of cases is of more than doubtful value, for the reason that the anterior displacement is rarely the cause of the bladder-symptoms, which in the vast majority of cases depend upon general nerve-disturbance, and are not of local origin. In the same manner, the dysmenorrhea is not dependent upon the displacement and consequent obstruction, but upon a complicating endometritis.]

Prolapsus Uteri.—The mechanism of the uterine descent in complete procidentia uteri has been exhaustively studied by Grace Peckham-Murray,² with the following conclusions as to the rôle played respectively by the perineum, the vagina, the ligaments, and the intraabdominal pressure: The pelvic floor has little to do with causing complete procidentia. The proofs of this are, that it occurs in children and in young women without so much as destroying the hymen, and it is rarely if ever seen in cases of complete laceration of the perineum.

The vagina may have both an active and a passive function in producing descent. If the band and levator ani muscle which surround its tube in the lower third are lacerated, and its lower portion is still held by the rectum, the muscles surrounding it act with a powerful traction to bring down the posterior wall of the rectum. This traction, with traction of a like nature on the part of the bladder, causes a prolapse of the vagina, alone if confined to the lower portion, but when it involves the upper portion there is dragging of the neck of the uterus, and this, if the uterine supports are not lax, results in the great hypertrophy and lengthening of the neck that simulates complete procidentia. If the uterine ligaments are relaxed, the uterus will follow sooner or later. The softening and relaxing of the connective tissue during pregnancy make the detachment of the uterovesical and vaginovesi-

¹ Jour. Am. Med. Assoc., Aug. 11, 1894.

² Am. Jour. Obstet., March, 1894.

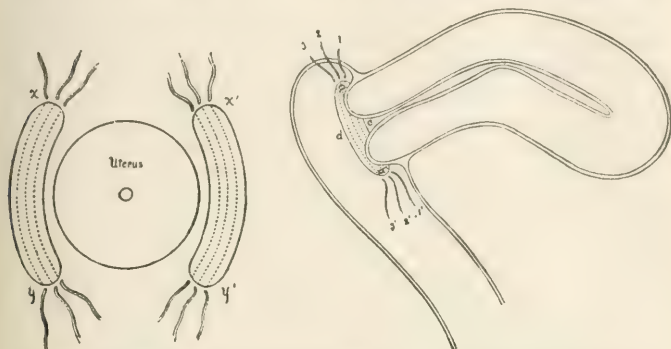
cal attachments an easy matter, predisposing to prolapsus. The uterus can press down the vagina before it, making the vagina a passive agent in cases of rapid labor when the os is not dilated and the uterus descends toward the vulva with the expulsive force of the third stage; also when it is heavy from lack of involution. The vagina affords support to the uterus by its attachments to its neck; but it is a question whether it acts as a supporting column in the mechanic sense expressed by some writers, and whether the angle it forms with the uterus has a supporting value. Clinical experience shows many cases in which the walls of the vagina bulge and are prolapsed, in which the uterus retains its position, and also many cases, notably cases of congenital retrodisplacements, in which the uterus remains at its normal plane. The action of the ligaments is more passive than active. They are naturally lax, owing to the necessity of uterine movements and uterine growth in pregnancy. If traction occurs from below and the ligaments are lax, descent of the uterus is more facile. The importance of the uterosacral ligaments is exaggerated by most writers. The appearance of the ligaments in cases of prolapse does not show this action; the stretching, breaking, and elongating are the result of the displacement, not its cause. In this respect experiments on the cadaver may be trusted for displacements of the uterus on the normal plane, but not in descent.

The greatest factor to be considered in uterine displacements, and the least understood, is the intraabdominal pressure. In the normal state there is such an adjustment of this that the uterus is easily maintained in position without much aid from ligament, vagina, or perineum, in spite of the weight of the abdominal viscera or the great and constantly recurring force of the expulsive effort. When this equation is disturbed descent becomes easy. The maintenance of the uterus in proper position is more a question of physiodynamics than is generally supposed.

Owing to laxity of tissues, inherited or the result of disease or subinvolution, there may be a greater predisposition to procidentia uteri. The loss of fat has nothing to do with it, cases of this nature occurring very frequently in women who have great accumulations of fat in the abdomen and other parts of the body. The shape and inclination of the pelvis may also favor this condition. Some writers think that too much stress is laid upon the effects of pregnancy as an etiologic factor. Owing to its relaxing effects on all the ligaments and connective tissue, the heavy uterus of subinvolution, and insufficient care, it can be held responsible for 90 per cent. of the cases.

[The pelvic floor, in the opinion of most gynecologists, has much to do with the production of prolapsus uteri. If this does occur in young women and old maids (cases of comparative rarity), it only goes to prove that the disease can occur from causes other than injuries to the pelvic floor; it in no way vitiates the fact that 95 per cent. of these cases do arise from such injuries. As to prolapse not occurring in cases of complete laceration of the perineum, the cause is not far to seek. Such rents occur in the median

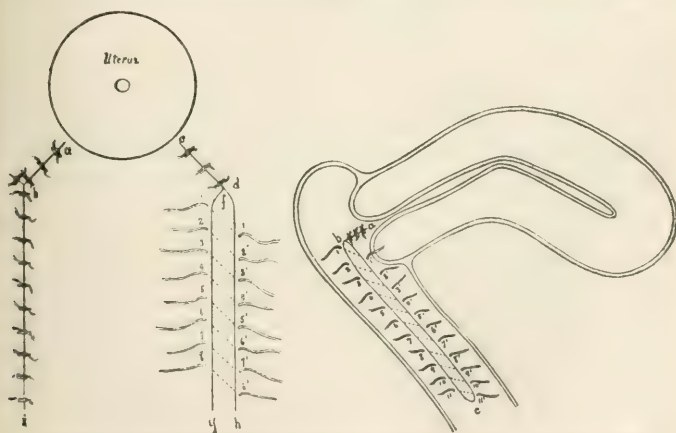
line of the vagina, and the aponeurotic attachments of the levator ani muscle are torn, but rarely the belly of the muscles; therefore the muscles do not lose their points of attachment, and consequently do not retract, and, as a result, the integrity of the pelvic floor is for the most part preserved. The



FIGS. 20, 21.—Dudley's operation for procidentia uteri (N. Y. Jour. of Gyn. and Obs., July, 1894)

explanation given by Dr. Murray is good so far as it obtains, but it is wholly true only in a very small class of cases.]

In the treatment of uterine prolapse Dudley's¹ method of *lateral elytror-*



FIGS. 22, 23.—Dudley's operation for procidentia uteri (N. Y. Jour. of Gyn. and Obs., July, 1894).

rhaphy has attracted more than a passing notice. It is performed as follows: The patient in Sims's posture, the uterus is strongly anteverted; two

¹ N. Y. Jour. of Gyn. and Obs., July, 1895.

circular areas ($x\ y$ and $x'\ y'$) are then denuded in the vaginal wall near to the uterus, about one centimeter to either side of that organ; their concavity should be turned toward the cervix, as seen in Figures 20 and 21, Figure 21 being a section. Each denuded surface is then closed upon itself by the aid of silk sutures, as shown in Figures 22 and 23. It becomes necessary to denude two strips of a little less than a centimeter, extending from the point b to the point d (Fig. 22), and from the point b to the point c (Fig. 23), the length of the lateral wall of the vagina up to the vulvar orifice, ending on either side of the urethra. The lateral extremities of each of these two denuded surfaces are approximated by sutures running obliquely to the denuded surface (Figs. 22 and 23). One side of each of these denuded strips is turned to the anterior wall of the vagina, and the other side to the posterior wall. The line of union made by the suture d (Fig. 24) closes and

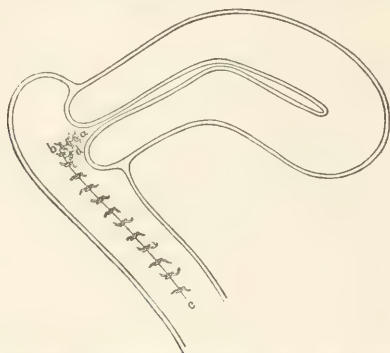


FIG. 24.—Dudley's operation for procidentia uteri (N. Y. Jour. of Gyn. and Obs., July, 1894).

imprisons the jutting portion of the denudation produced by the sliding of the anterior wall upon the posterior wall. The anterior wall is drawn up behind the posterior vaginal wall and fixed there. The neck of the uterus thus forms, so to speak, part of the anterior vaginal wall. The superior extremity of the vagina is thus restored, and the anterior vaginal wall resumes its normal position and direction; the cervix also assumes its normal position, pointing toward the concavity of the sacrum. Intractable cases of procidentia, all operators agree, require either hysterorrhaphy or vaginal hysterectomy for their ultimate correction. These operations should, however, always be followed by kolpoperineorrhaphy.

UTERINE ANOMALIES.

Some interesting anomalies of the uterus have been noted during the year. Probably the most curious is the case reported by Depage,¹ of a girl, twenty-two years old, in whom menstruation first appeared at the age of

¹ Archives de Tocologie et de Gynéc., vol. xxi., No. 7, p. 550.

eighteen years, and who from this time had suffered with vague pains in the back and abdomen, becoming progressively more localized. The pain occurred in paroxysms setting in on the fifth day of menstruation and lasting at times for ten days. Menstruation was otherwise normal. There was, however, a slight leukorrhea. Tumefaction of the abdomen had never been observed. On palpation a tumor about as large as a fetal head was detected in the left iliac fossa, extending a little to the right of the median line. The mass was slightly movable, appeared to fluctuate, presented an irregular though not lobulated surface, and dipped into the pelvis. To the right and below, directly behind the pubis, a second tumor, harder than the first and not fluctuating, could be felt; it was about as large as a fist and also dipped into the pelvis. On vaginal examination the cervix uteri could not be felt, but a tumor projected into the vagina. With the aid of a speculum the cervix was found displaced forward and to the right. It was almost effaced, and manifested itself as a small round opening. By means of a sound the uterus was found to be displaced to the right; the bladder was likewise displaced to the right and was situated directly in front of the uterus. On conjoined vaginal examination and abdominal palpation it was found that the two tumors were movable upon each other. It was at first thought that the condition was one of ovarian cyst, but it was finally concluded that there existed multiple subperitoneal fibromata of the uterus. Abdominal section was decided upon, and after opening the abdomen a fluctuating cystic tumor was found in the left broad ligament, intimately connected with a solid tumor behind the pubis and projecting into the vagina. The cyst was adherent to both omentum and intestines. On introducing the hand into the right iliac fossa the ovary was found enlarged and cystic, and it was extirpated. It was found impossible to remove the cyst and the tumor through the abdominal wound, and after a ligature was applied to the pedicle of the tumor the abdomen was closed, a provisional dressing applied, and the woman placed in a position for the removal of the new formations through the vagina. An incision was made around the cervix, the uterus dissected from the bladder, the culdesacs opened, clamps applied, and the tumor-mass removed. The wounds were closed and suitable dressings were applied. The patient made an uneventful recovery. The cystic tumor was found to involve the left ovary. The remainder of the mass consisted of a uterus with three divisions. One of these communicated with the right tube and one with the left tube. The third was a closed sac connected with the common neck of the other two. The walls of all consisted of typical muscular tissue and were lined by characteristic membrane and contained utricular glands. [The explanation of the occurrence of the trifold uterus is thought to reside in the formation of a diverticulum from one portion of a bifid uterus, resulting from a failure of union of the ducts of Müller.]

Werder¹ has encountered a case of didelphic uterus, complicated with lateral hematokolpos, hematometra, and hematosalpinx, in a young girl

¹ Jour. Am. Med. Assoc., Aug. 11, 1894.

eighteen years of age. Tuttle¹ and also Faidherbe² have noted instances of congenital absence of the internal genitals. Tuttle's case was a woman, twenty years of age, giving a history of complete amenorrhea. There was found an absence of the uterus and ovaries, together with a rudimentary condition of the vagina. A peculiar feature of the case was that the woman had led a bad life and was suffering from gonorrhea of the rectum and urethra. Despite the absence of her sexual organs, there was good general development and an appearance of perfect femininity. A precisely analogous case was recently seen by Dorland at the Polyclinic Hospital, Philadelphia. The patient was nineteen years of age; there was complete amenorrhea, and total absence of the uterus and its appendages. The sound showed a vaginal depth of about an inch. The pubic hair was well developed, but there was no sign of mammary development. Faidherbe's case was a girl, twenty years of age, with a history similar to that of the foregoing case, and with complete absence of the genital organs.

UTERINE INFLAMMATION.

Metritis.—The treatment of acute metritis, as suggested by Lutaud, consists in absolute rest, laudanum-fomentations upon the stomach, and frequent hot irrigations with emollient and slightly aromatic liquids. An excellent injection is composed of the following mixture: Chloral, naphthol, and alcohol, of each ʒiij; water ʒviij; a tablespoonful of this being added to a quart of hot water. In case of very severe pain, blisters applied to the abdominal surface give relief. Scarification and leeches applied to the os are absolutely useless during the acute stage.

Endometritis.—The pathology and histogenesis of endometritis are becoming more generally understood. Amann, Jr.,³ from a study of tissue removed with the curet is disposed to believe that the condition usually described as chronic endometritis partakes more of the character of a neoplastic than of an inflammatory formation. In so-called "interstitial" endometritis he found marked karyokinesis of the cells of the mucosa and of the endothelium of the smaller blood-vessels, with only a small amount of chromatism. The extensive proliferation of the cells lining the capillaries causes a certain friability of the vessel-walls, that explains the tendency to hemorrhage. The surface-epithelium in the so-called "glandular" form of endometritis shows little, if any, tendency to proliferate. In another variety of the condition the proliferation seems to be almost entirely confined to the superficial epithelia, though it may affect the deeper layers and lead to the gradual formation of squamous epithelium (*psoriasis uterina*). Leukocytes were found undergoing segmentation not only in the lymph-vessels and blood-vessels, but also in the mucosa. The general disposition of the cells to karyokinesis and their poverty in chromatin in chronic endometritis are by no

¹ Internat. Jour. of Surg., viii., No. 5, p. 136.

² Jour. des Sci. méd. de Lille, Jan., 1894.

³ Centralbl. f. Gynäk., No. 17, 1894.

means an evidence of malignant degeneration. Uter¹ reports the results of the microscopic examination of the tissue removed by the curet in 50 cases of endometritis as follows: 1. *Endometritis following Abortion*.—In 5 cases were found cuboid epithelial cells, as decidual cells and connective tissue. In 3 of the cases a positive diagnosis had previously been made. 2. *Gonorrheal Endometritis*.—(a) *Acute*.—The mucosal epithelial cells were found destroyed, but the glandular epithelium was intact. The chief changes were noticed in the interglandular connective tissue, where the cell-nuclei were much enlarged and a small round-cell infiltration could be distinctly seen. (b) *Chronic*.—In these cases the mucosal changes were the same as those seen in the ordinary chronic endometritis. 3. *Chronic Endometritis*.—(a) *With Complications*.—Two classes of cases are described—namely, those in which the glands have partially or completely disappeared and the interglandular tissue shows hyperplastic changes (*endometritis fungosa*), and those in which the glands are apparently normal, and the interglandular tissue shows a marked increase in the size of the cell-nuclei (*interstitial endometritis*). (b) *Complicated with Other Diseases*.—In a case of habitual abortion, always occurring in the first months of pregnancy, the microscopic examination showed an enormous hyperplasia of the glandular tissue. In two cases of postpartum subinvolution of the uterus an associated acute endometritis was found. In a case of associated carcinoma of the ovaries and uterus a fungous endometritis was found.

Jacobs² regards the endometritis of the menopause as an arteriosclerosis followed by a diffuse sclerosis, causing atrophy of the unstriped muscle-fiber, which gradually becomes absorbed and replaced by fibrocellular tissue. The uterine mucosa diminishes in thickness after the climacteric, its cells atrophy and undergo changes in shape, and the protoplasm is occupied by fatty granules. These conditions may cause an endometritis or some malignant degeneration. The fetid discharge of the endometritis is due to the fact that the leukorrhea escapes slowly and has difficulty in finding an outlet, and thus has time to decompose. Skene³ considers senile endometritis as quite a different condition from the endometritis of early life. The disease usually includes the entire mucosa, and is generally suppurative in form. The epithelium of the endometrium becomes almost entirely lost; granulations of low vitality spring up; minute extravasations of blood are seen, with small pigment-spots; atrophy of the muscular tissue is present and causes inversion of the mucosa. The endometritis occurring in women after the establishment of the menopause—*endometritis fetida*, or fetid endometritis—is, according to Gabriel Maurange,⁴ doubtless due in some instances to the reawakening of an old infectious process or to a necrobiosis accompanying the elimination of a moderate-sized fibroma; but these causes cannot explain

¹ Zeitschrift f. Geburt. u. Gynäk., Bd. xxv., 1894.

² Arch. de Tocologie et de Gynéc., Nov., 1893.

³ Am. Jour. of Obst., April, 1894.

⁴ La Presse méd., Jan. 26, 1895.

other cases. Levrat,¹ finding the disease complicating a cardiac affection in three women aged respectively sixty-two, sixty-five, and sixty-seven, considered that the two conditions might be allied, and he therefore gave it the name of *métrite putride cardio-sénile*. Fritsch² denies this and calls it atrophic endometritis (*Die atrophisirende E.*); he is supported by Patru in a more recent memoir.³ Tolochinoff⁴ has described a rare form of senile metritis characterized by vaginal irritation, a periodic evacuation of pus, emaciation, and a yellowish tinge of skin. The importance of making a diagnosis between this disease and primary carcinoma of the body cannot be too strongly insisted upon. Maurange gives three instances of this disorder, one occurring in his own practice. One case was well after two years had elapsed, another was lost sight of, and in the last no note was made. He concludes that the malady appears at varying periods (from five to fourteen years) after the menopause, and attacks women who have borne children rather than nulliparæ. The history and symptoms of a case may be summarized as follows: At an indefinite period after the menopause a more or less abundant discharge appears; this is at first intermittent. The fluid is sometimes thick and purulent or pinkish in color, and in exceptional cases of the consistence and appearance of blood; it is always extremely offensive. In addition there may be vomiting, rapid emaciation, anxious and icteric facies, much like that observed in the later stages of carcinoma. There may be vague pains, somewhat like those observed in other uterine disorders. On examination signs of considerable vaginal irritation will be found, the cervix healthy, the uterus slightly enlarged, but quite mobile; passage of the sound gives pain; on withdrawal of the instrument a small amount of sanguineous pus escapes from the uterus, which is very fetid. The mucosa is turgid and ulcerated in parts, and easily detached by the curet. Microscopically, the disease does not differ essentially from chronic endometritis. It is rebellious to treatment. A strong application of glycerol of carbolic acid to the uterine interior is frequently beneficial, but thorough and deep curetting is the surest method of cure. Emanuel⁵ believes that the different forms of tuberculosis of the female genital tract depend on different causes. When the tubes are not involved, but the most exposed parts of the tract—the vagina and cervix—are tuberculous, the most frequent source of infection is coitus; the finger of the physician or a sound or other instrument may also carry tubercle into the patient's system. Tubercle of the uterine cavity and tubal mucosa may also be due to infection in coitus, but in the majority of cases the disease is secondary.

[The treatment of endometritis remains the same as heretofore, with but trifling modifications. Ichthyol still meets with general favor as a topical application, and its use is followed by satisfactory results.] Professor

¹ Prov. méd., Oct. 17, 1891.

² Handbuch f. Frauenkrankheiten, Bd. i. S. 990.

³ Endométrite purulente sénile, ou Endométrite atrophiante.

⁴ Archives de Tocologie, 1883.

⁵ Zeitschr. f. Geburt. u. Gynäk., vol. xxix., 1894.

Winckel¹ suggests formol or formic aldehyd as a good medicament in the treatment of vaginitis and catarrhal or gonorrheal endometritis. He employs a solution of formol, 10 parts to a liter of water. Baldy² believes that the future advances in the treatment of pelvic inflammatory diseases must be in the direction of prophylaxis, and, as all such diseases originate in an acute endometritis, he urges the free use of intrauterine antiseptic irrigations, the sharp curet, and iodoform-gauze packings. Fritsch³ reports a case of obliteration of the uterine cavity after curettage in a woman twenty-five years of age, shortly after a normal labor. This accident, he thinks, can only occur during the period of fatty degeneration of the uterus from severe curetting, during which process all of the endometrium is removed and the muscle-tissue torn; he thinks it is scarcely possible at any other time. For the gonorrheal cases Noch⁴ recommends a salve consisting of alumnol 7.5 grams, lanolin 100 grams, distilled water and glycerol, of each 25 grams. This is to be injected every three or four days. In the treatment of chronic cervical endometritis in nullipare Bouilly⁵ has had no success with curetment and topical applications, and suggests, instead, the following operation: For two days he dilates the uterine cavity; he then cures the cavity, fixes the upper and lower lips with forceps, and with a long, narrow-bladed bistoury a flap, two, three, or four millimeters thick, according to the thickness of the tissue, is removed from the half-circumference of each lip. The mucosa is thus abraded so as to form two excavations with their cavities opposed to each other; the mucosa on the sides of the cervix is carefully preserved, as it is necessary for the regeneration of this tissue. The external orifice is widely opened, and the cavity of the cervix is packed with iodoform-gauze. The author has performed this operation forty times with only one failure, and twice conception has taken place in women who had been sterile for a long time.

Bacon⁶ in discussing the question claims that Winter has proved that all cases of endometritis are due to germs; he says that the different varieties of the disease are due to different varieties of the germs, and that the rational cure is first by curettage, drainage, and irrigation to remove the soil in which they grow, and then to apply strong antiseptics to the endometrium to destroy germs remaining there and prevent their propagation. The efficiency of iodoform-gauze as a means of uterine drainage has been severely criticized by Snger⁷ and Coe.⁸ Both of these authorities conclude that the gauze, so introduced, acts as a tampon favoring the retention of the uterine secretions rather than as a means of drainage. The gauze only permits the discharge of a thin, watery secretion, but not the escape of purulent or viscid material and coagulated blood. There is neither disinfection of the uterine cavity, as Abel maintains, nor the establishment of permanent drainage, as claimed

¹ Jour. de Md. de Paris, Oct. 28, 1894.

² Univ. Med. Mag., Oct., 1894.

³ Centralbl. f. Gynk., No. 52, 1894.

⁴ Therapeutische Bltter, July, 1894.

⁵ Pacific Med. Jour., Nov., 1894.

⁶ Atlanta Med. and Surg. Jour., July, 1894.

⁷ Centralbl. f. Gynk., No. 25, 1894.

⁸ N. Y. Polyclinic, Sept. 15, 1894.

by Skutsch. Schmeltz¹ recommends the substitution for the gauze of catgut threads, and suggests that good results follow their employment in the following conditions: Puerperal, catarrhal, or gonorrheal metritis, when they can be used after curetting or cauterization; chronic catarrhal or purulent salpingitis; uterine displacements—the over-congestion of the uterus being relieved by drainage, the organ can be replaced; amenorrhea and dysmenorrhea—here catgut drainage has been particularly successful in relieving symptoms; and, finally, in atresia of the cervix.

The osmotic method of medication, as recommended by Wells,² consists in the induction of a profuse exosmosis of serum from the capillaries by the application to the cervix of prepared lamb's wool saturated with glycozone (glycerol subject to the action of ozone and made powerfully antiseptic), repeated every third day, and this continued until the parts have lost the appearance of congestion, when the treatment may be extended within the cervical canal by means of the cotton-wrapped, hard-rubber probe-applicator. A sterilized sponge, bleached by the action of ozone and attached to a string, is saturated with equal parts of hydrogen dioxid and warm water, and applied for twenty-four hours to the os and cervix. This can then be cleansed in warm, weak ammonia-water, again medicated, and readjusted. Under this course of treatment the inflammation is said to rapidly improve.

Cauterization of the endometrium, if properly performed, is of great value. Snger³ believes that the true action of intrauterine caustics has been generally misunderstood. Gynecologists do not allow sufficient time for the caustic to act, but repeat the application at frequent intervals without waiting for the slough to separate; hence frequently arise cicatricial stenosis and other bad results. The proper method is to apply strong caustics at long intervals, such as a 50 per cent. solution of zinc chlorid applied at intervals of from sixteen to twenty days. The thermocautery is the ideal aseptic caustic in the treatment of cervical erosions. Alexandroff's method of the application of electric vaginal tampons is claimed to exert a direct germicidal action. The interpolar currents thus applied have been employed in more than a hundred varied cases without any accident or even the formation of an eschar.

MALIGNANT DISEASE OF THE UTERUS.

Sarcoma.—The admirable contributions of J. Whitridge Williams⁴ to the histology and histogenesis of sarcoma of the uterus offer a more thorough and correct classification of this comparatively rare disease than has as yet been adopted. Two great groups of uterine sarcomata are recognized—namely, those affecting the mucosa and those involving the parenchyma. Sarcoma of the endometrium occurs either as a diffuse infiltration of the mucosa or as circumscribed growths that tend to assume a polypoid form; the former is the more frequent, and is usually situated at or near the fundus.

¹ Arch. of Gynec., xii. 10, 1894.

³ Loc. cit.

² Chicago Med. Times, July, 1894.

⁴ Am. Jour. Obst., No. 6, 1894.

In most cases the process remains limited to the mucosa, but it may invade the uterine wall and lead to its destruction. Sarcoma of the parenchyma also appears in the diffuse and circumscribed forms, the latter bearing a marked resemblance to myomata, but not usually surrounded by a capsule. Microscopically, uterine sarcoma may consist of round cells, spindle-cells, or giant-cells, or a mixture of these forms. The round cells are the most frequent, but the spindle-cell is not of great rarity. Sarcoma of the cervix uteri is a more common condition than authorities affirm. The grape-like variety (*sarcoma botryoides*) is the most common form encountered here; this grape-like development is due simply to the presence of preformed cavities that become dilated. The combinations of uterine sarcoma with other tumor-formations are adenosarcoma, carcinosarcoma, chondrosarcoma, and osteosarcoma, with a still more recently discovered and more malignant variety, the *deciduocellulare*, *deciduoma malignum*, or *malignant deciduoma*. This is composed of areas of large epithelioid cells closely resembling decidual cells, the areas being separated by areas of hemorrhage; it gives rise to metastasis. Sarcoma of the endometrium can have only two sources of origin—the interglandular tissue and the vessel-walls. Sarcomata of the parenchyma of the uterus have been supposed by many authorities to be invariably the result of secondary changes in uterine myomata, but they also may arise from the interstitial connective tissue or the blood-vessels of the uterine wall. Pick¹ concludes that the transformation of uterine fibromyoma into sarcoma is due to a direct change of smooth muscle-fibers into sarcoma-cells, as well as a development from the connective tissue or vessel-walls of the primary growth. Neoplasms having the former origin are to be regarded as true mixed growths (*myoma sarcomatosum*). Hyaline degeneration is frequently observed in uterine sarcoma, but it seems to bear no relation to other degenerative processes.

Carcinoma.—The recurrences of uterine carcinoma have been grouped by Winter² into three varieties—namely, local or wound-recurrence, lymphatic-gland infection, and metastasis. The latter takes place through the blood-current to the internal organs, and is very rare, occurring only in 2.5 per cent. Lymphatic-gland recurrence is also rare, and is seen when the uterine carcinoma comes under observation late in the disease, the inguinal, iliac, or lumbar glands being involved. The infection of these glands generally first appears when there is perhaps the smallest carcinomatous infiltration of the parametrium, and, therefore, only exceptionally in these cases can a good result follow operation. The local return is usually small, and is caused by leaving behind a portion of the growth at the primary operation. It therefore commonly begins in immediate relation with the incision-cicatrix, and extends to the lateral portions of the parametrium—that is, posteriorly toward the sacroiliac articulation. To avoid local or wound-recurrence only those cases should be operated upon in which

¹ Archiv f. Gynäk., Band xlviii. Heft 1.

² Zeitsch. f. Geburt. u. Gynäk., Bd. xxvii. Heft 1, 1894.

the disease has not reached the parametrium, and at the operation great care should be taken that no carcinomatous tissue, and only healthy tissue, is incised. It is known that carcinoma possesses the power of infecting healthy tissue by simply touching it, as may occur where there is a fresh wound and living carcinomatous tissue. Winter believes that it is because of inoculation at the time of operation that carcinoma of the vaginal cervix most frequently, carcinoma of the cervical canal rarely, and corporeal carcinoma of the uterus scarcely ever, returns. The carcinomatous tissue should be primarily cauterized with a Paquelin, and a strong disinfectant solution applied, thus converting it into a harmless tissue.

[The early diagnosis of carcinomatous disease is of the most urgent import, since vaginal hysterectomy performed prior to cell-infiltration of the adjacent tissues will effectually remove the disease. An unusual hemorrhage or discharge in a woman who has borne children should be considered ample reason for the making of a vaginal examination, especially should the patient have any hereditary reason for fearing carcinoma.] Stone¹ urges the adoption of a system of vaginal examinations at intervals of six, twelve, or eighteen months in all women between the ages of forty and fifty, and the performance of operation upon the first appearance of the disease. Herman² considers a smooth, dark-red spot upon the cervix, bleeding upon contact, as a very suspicious symptom indicative of the earliest stage of carcinoma, the suspicion being stronger should a nodule be felt. Hemorrhage and leukorrhea are the primary symptoms, pain and emaciation appearing later.

[Total extirpation of the uterus through the vagina is the operation generally selected for the early stages of the disease, although the abdominal route is used by some operators. Martin of Chicago fixes the rate of mortality in the hands of experienced operators at 5 per cent. The points upon which hangs most of the disputation at the present day are not the choice of operation, but some of the details of the technique. Prominent among these may be mentioned the choice between clamps and ligatures in the securing of the broad ligaments, the closure or nonclosure of the peritoneal edges left after removal of the uterus, and, should ligatures be used, the length of their ends. It is becoming very general now to leave the peritoneal edges ununited, maintaining the opening by drainage-strips, and allowing the parts to close by the process of contraction. The reasons for this course of procedure are the greater rapidity of the operation, and hence the diminished amount of shock and exposure, and the securing of better drainage. The opponents of this plan claim that immediate closure prevents the formation of a hernia and of adhesion, diminishes the chances of sepsis, and conduces to a more rapid convalescence. They also claim that drainage is to a large extent unnecessary, only being required for the cut surfaces. Hemostasis by clamps is largely becoming a thing of the past, although from time to time a new modification of the clamp-method is suggested, destined, however, to but a short existence. So, also, it is now very conclusively settled that all ligu-

¹ Virg. Med. Month., vol. xx., No. 12, 1894.

² Brit. Med. Jour., May 12, 1894.

tures should be cut off short, no threads being left to become entangled or liable to sudden dragging in the removal of the dressings.]

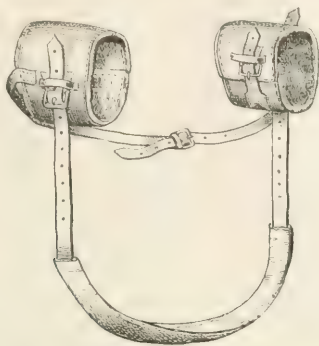


FIG. 25.—The Bissell crutch (N. Y. Med. Rec., June 23, 1894).

In the performance of vaginal hysterectomy the crutch invented by Bissell (Figs. 25, 26) has been recommended because of its chief and import-

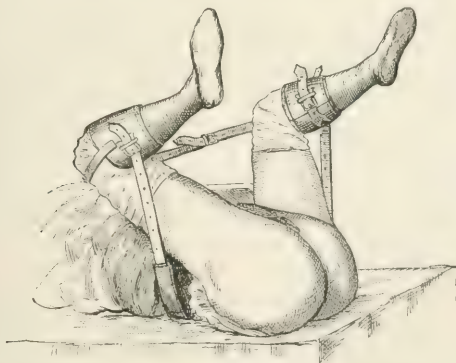


FIG. 26.—The Bissell crutch applied (N. Y. Med. Rec., June 23, 1894).

ant feature, which is that it takes its support from the back, in the lumbar region, instead of from the neck and shoulders. It consists of one strap, broad in its central part, which is covered by india-rubber, with its two tapering ends perforated with the proper number of holes, by which it is attached on either side to two broad padded leather bands that fit about the legs just below the knees. There is another strap that is buckled to these same bands between the knees. [There seems to be no practical advantage in this apparatus over those in common use.]

To avoid infecting the peritoneum when the fundus is drawn out, and also to give more room for the easy extraction of the body of the uterus through the anterior vaginal incision, Cleveland¹ (Fig. 27) first performs a high

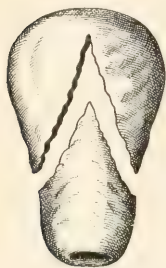


FIG. 27. — Cleveland's vaginal hysterectomy, showing method of amputating the cervix (N. Y. Med. Rec., June 23, 1894).

amputation of the cervix, including a large, wedge-shaped portion of the corpus uteri, employing for the purpose a pair of large serrated scissors. The incisions from either side are often carried to within half an inch of the top of the fundus, where they meet. The fundus is then readily drawn out by a large hook inserted at its top, great care being taken to avoid the intestines. By this method even very large uteri may be removed. *Supravaginal amputation* of the cervix—that is, the removal of the entire cervix together with a large cone-shaped piece of the body—is quite in vogue among English gynecologists. [While removing more tissue than simple cervical amputation, the operation is still subject to the same objection as the latter operation, and cannot supplant total extirpation in the estimation of abdominal surgeons. In addition, the dangers of serious hemorrhage and sepsis are much graver than in complete removal of the organ.]

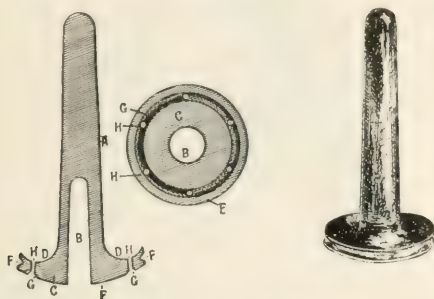
Pratt's method of vaginal hysterectomy without clamps or ligatures [which is, in fact, nothing more than a revival of Langenbeck's operation] is said to be applicable to cases of small intramural fibroids causing sufficiently severe symptoms to indicate operative interference; to cases of procidentia; and to cases of early carcinoma of the cervix. [In spite of which recommendation it should never under any circumstances be used in malignant cases, as of necessity it leaves behind tissue that cannot fail to be infected.] It is contraindicated in advanced malignant growths, in tumors too large to be removed through the vagina, and when pyosalpinx exists as a complication. The uterus is enucleated from its peritoneal and areolar investment without injury of the vascular supply, the vessels being pushed aside as they lie imbedded in these tissues. The loss of blood is trifling, and as the vessels are not injured they remain to repair the wounded parts; the diseased tissue, also, is not disturbed, so that the danger of wound-infection is almost nil. [While it is as yet too early to advance any final views as to the merits of this operation, it would seem that it would be of little value, and also that it is impracticable.]

In order to serve as a guide in making the incisions through the vaginal vault in vaginal hysterectomy by accurately defining the border of the cervix, [Tuttle² has devised an instrument, consisting of a hollow stem with a cap made to fit over the cervix, which, when introduced into the uterus, makes that organ firm, rigid, and more easily manipulated, while the edge of the metal cap serves as a director in cutting down from above and defines the borders of the cervix. The concavity of the cap forms a receptacle

¹ N. Y. Med. Rec., June 23, 1894.

² Boston Med. and Surg. Jour., Oct. 18, 1894.

for iodoform or other antiseptic powder, and with the cone effectually corks up the uterine canal, which is furthermore hermetically and strongly sealed by a line of silk sutures passed around the cervix and through the small holes in the disk. The description of the instrument is as follows:



FIGS. 28, 29, 30.—Tuttle's method of total extirpation of the uterus (Boston Med. and Surg. Jour., Oct. 18, 1894).

The central cone (*a*), that fits into the uterine canal, is $\frac{3}{8}$ inch in diameter, and tapers down to $\frac{1}{4}$ inch, and the length in three sizes is respectively $1\frac{3}{4}$, 2, and $2\frac{1}{4}$ inches. It is penetrated to the depth of an inch with a central cavity (*b*), which is bored with a $\frac{3}{16}$ -inch drill and reamed out to $\frac{1}{4}$ inch at the orifice, ending blindly. The cap (*c*) is a circular disk, $\frac{3}{4}$, 1, and $1\frac{1}{4}$ inches in diameter, slightly convex on the outside (*e*), and deeply concave on the inside, the concavity forming a wide groove (*d*) about the attachment of the cone. In the edge of the disk a narrow groove (*f*) is cut for the purpose of guiding the point of the knife in the abdominal dissection. A narrow groove (*g*) is also made on the convex side within $\frac{1}{16}$ inch and parallel to the edge of the disk. In this groove, at regular intervals apart, there are six small holes, that perforate the disk and are intended to receive the sutures that fasten the instrument to the cervix, and which are tied into and protected by the groove (*h*).

In performing the operation by this method the patient is placed in the lithotomy position, and after thorough asepsis of the vagina six strong silk sutures are passed so as to completely surround the cervix, and their ends kept long enough to tie easily. If the cervical tissue is normal, it is better to hold the instrument, and the needle should pass through it, as seen in Figure 31; but if the disease has extended beyond the cervix, it will be necessary to pass the sutures, in part at least, through vaginal tissue. The uterine canal is again dilated to facilitate the easy entrance of the seal and douched with an antiseptic solution; the seal is then passed wholly in, and, if found to fit satisfactorily, is partially withdrawn, so as to enable one to bring the sutures through the small holes in the periphery; the sutures are now drawn

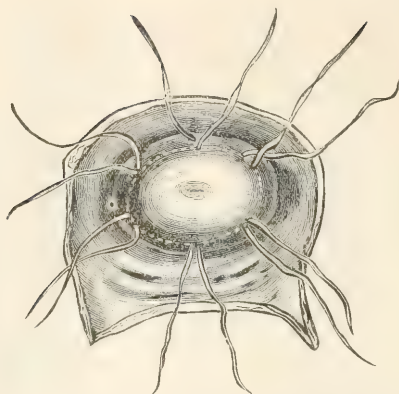
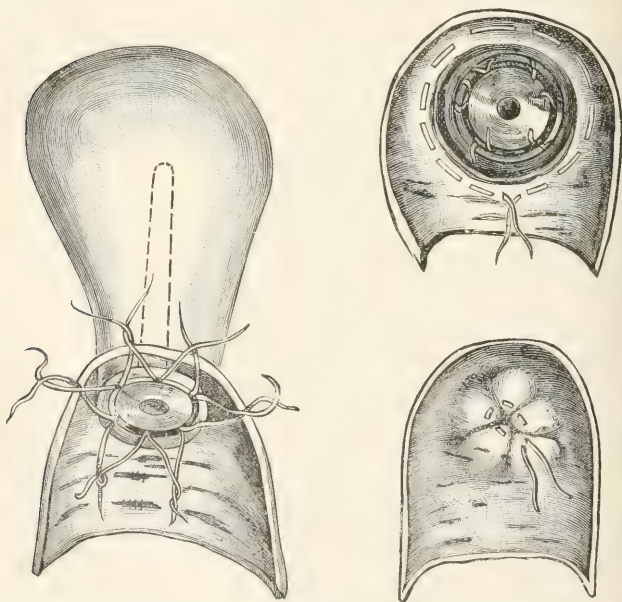


FIG. 31.—Tuttle's method of total extirpation of the uterus, showing cervical seal in place (Boston Med. and Surg. Jour., Oct. 18, 1894).



FIGS. 32, 33, 34.—Tuttle's method of total extirpation of the uterus (Boston Med. and Surg. Jour., Oct. 18, 1894).

through the small holes by means of a small crochet-hook, such as is used by women, and in the same manner, by passing the hook through the hole, catching the sutures one at a time, and withdrawing both hook and thread. The two ends of the sutures nearest each other are drawn through the same hole. The groove is then filled with iodoform by slightly depressing the cap, and the instrument is pushed as far as it will go into the uterus. The seal in place, with the sutures, is shown in Figure 32. The sutures are drawn tight and tied in the groove, so as to firmly fix the instrument to the uterus. A continuous line of running suture is now passed, well outside of the edge of the seal, through the walls of the vagina, so as to completely encircle the cervix, and the two ends of the suture are left long enough to tie. Care must be taken not to pass the suture too deeply in the region of the bladder, lest this viscus be injured. The suture *in situ* is seen in Figure 33. After separating the cervix from the vaginal vault the vagina is closed below the cap of the seal by drawing tightly on the ends of the sutures in the manner of a purse-string. The operation is then concluded through an abdominal incision. Mackenrodt¹ believes that the operation of complete hysterectomy for carcinoma of the uterus does not by any means offer absolute results, but that the disease returns in more than half of the cases operated upon. This is due to inoculation of healthy tissue from the carcinomatous portion in some cases, and in others to the fact that the operation is not radical enough.

The Palliative Treatment of Carcinoma.—According to report, Vulliet's² method of the injection of absolute alcohol into the parenchyma of the neoplasm and the adjacent tissues has yielded fairly good results. The alcohol gives rise to an artificial local cirrhosis that envelops and penetrates the neoplasm. In consequence of the narrowing of the vessels in the indurated areas the circulation is reduced both in the infiltrating and infiltrated tissues, and, in addition, the formation of a zone of fibrous tissue acts as the most effective barrier against the extension of the disease. Dangerous symptoms have never been observed after the injections. Bernhart³ has obtained highly satisfactory results from parenchymatous injections of salicylic acid in alcohol (6 parts of the acid and 60 parts of the alcohol). About 30 minims are injected into the neoplasm in eight or ten different places. Some patients complain of severe pain during the injections, while others have none at all. There may be slight elevations of temperature. The results observed were as follows: Within three days after ulcerating nodules had been thus treated, the ulcerations had healed and there was marked retraction at the sites of the punctures. After repeated injections (at intervals of four days) the affected nodules had greatly shrunk, and presented a smooth surface on which epithelium later developed. Meantime the patient's general health improved, pain and foul discharges ceased, and there was no further hemorrhage. These results were obtained in six cases of

¹ Zeitsch. f. Geburt. u. Gynäk., Bd. xxix. ² Allg. med. Central Zeit., No. 67, 1894.

³ Centralbl. f. Gynäk., No. 39, 1893.

inoperable carcinoma of the cervix, though the patients had not been kept under observation long enough to report as to their subsequent condition.

Internally, Jesset¹ administers small doses of arsenic bromid with good effect. Chian turpentine also appears in some cases to tend to cleanse the parts, and he has had prepared some tabloids composed, some of Chian turpentine, auric chlorid, and sulphur, others of turpentine, pyoktanin, and ichthyol, and these have proved most successful in these cases. After curetting, Boldt² sponges the cavity with a mixture of commercial acetic acid (ʒj), glycerol (ʒiij), and phenol (gr. xx), finally packing with absorbent wool. Bovee³ has had success with a powder suggested in 1890 by Dr. William Goodell, and consisting of equal parts of pepsin and salicylic acid. This is used locally, the carcinomatous tissue being destroyed (digested) by the pepsin, while the salicylic acid prevents putrefaction. Lutaud⁴ insufflates the following powder daily, the os being exposed by means of a speculum: Salicylic acid, gr. iv; boric acid, ʒj; iodoform, ʒij; essence of eucalyptus, q. s.

FIBROID TUMOR OF THE UTERUS.

[Fibroid disease of the uterus has claimed more than the ordinary amount of attention from abdominal surgeons during the twelve months just elapsed. Since the initiative taken in the improved technique of operative procedures by Chrobak and others of equal eminence in gynecologic surgery, all of whom have based their successes upon modifications of the original Schröder operation, a vast amount of literature has been presented, together with reports and statistics of the various methods of operation, so that we are to-day able to arrive at some pretty definite conclusion as to their respective merits. The closer concentration of the surgical mind upon this interesting pathologic condition has likewise resulted in a more accurate knowledge of its histologic construction, its method of growth and development, its symptomatology, the degenerations to which it is subject, the complications to be feared during and subsequent to its surgical removal, the value of the nonoperative treatment of the disease, and the lines of treatment most likely to be followed by a lessened mortality-rate. A mortality of less than 5 per cent. may now be looked for in the hands of competent surgeons, and so far as may be seen, there is no reason why this low death-rate may not still be materially diminished.] The investigations of Schottländer⁵ are interesting as bearing upon the etiology of the disease. He found in an isolated fibromyomatous nodule, situated on the exterior of a larger growth, glandular formations closely resembling the glands of the endometrium, while the tissue in their immediate vicinity presented the same structure as the submucosa. He explained the presence of these glands on the theory that when a myoma develops in the uterine wall it acts as an irritant both to the endometrium

¹ Med. Press and Circular, June 20, 1894.

² Arch. of Gyn., June, 1894.

³ Virg. Med. Month., June, 1894.

⁴ Der Frauenarzt, Heft 3, Jan. 9, 1894.

⁵ Zeitschrift f. Geb. und Gyn., Bd. xxvii., 1894.

and to the glands; the latter proliferate and extend from their original site to the tumor. It may be that small subperitoneal myomata were originally submucous, and that endometritis may be the initial factor in the causation of these as well as of the larger tumors.

An interesting question has been raised by Byford¹ as to the possible microbial origin of fibroid and of other benign tumors. While it is not yet possible to demonstrate the actual presence of such microbes, he claims that there are many facts inferentially pointing to a microbial origin. Thus in women fibroids occur much more frequently in the uterus, in which the tissues are more exposed to infection, than elsewhere. Not only do microbes readily gain access to the uterus, but its varying states of activity and vigor, and the frequency of inflammation, make it an easy prey to them. They seldom occur in the heart. Were the Cohnheim theory the true one, he would expect fibroids to occur frequently in the heart, which is subjected to strain and disturbance almost daily through excessive physical exertion, reflex excitation, valvular disease, and nephritis. The beneficial action of curetting and electricity are more easily accounted for by supposing that they act by relieving the inflammation and removing the germs. Ergot diminishes excessive vascularity in and about the tumor, and thus produces a condition less favorable to germ-action, and the same may be said of oöphorectomy and ligation of the arteries supplying the uterus. Sudden unaccountable increase or diminution of growth is most satisfactorily explained by microbial action. [This is a subject that merits further inquiry.]

Quénou² attributes the pain in fibromyoma to several factors, chief among which is pressure of the tumor upon the sacral plexus, especially if it is impacted in the pelvis, or upon the lumbar plexus when it extends upward into the abdominal cavity or is freely movable. Severe pains are also referable to pressure of the tumor upon the ovary when the latter is healthy. Irritation of the peritoneum, especially in Douglas's pouch, may cause pain even when there is no peritonitis. Inflammation of the growth itself, of its serous covering, and of the tubes and ovaries is also an important factor. Retention of blood within the uterine cavity and infection thereof may readily lead to inflammatory conditions in the tumor, on account of the rich vascular supply of the endometrium and its intimate relation to the fibromuscular tissue in the broad ligament.

That rare complication of fibroid tumor, malignant degeneration, has attracted some attention during the past year. Malthe³ records two cases for the relief of which complete extirpation through an abdominal incision was practised. Geuer,⁴ who has made a special study of this complication, has collected 46 cases which he classes as primary carcinomatous degeneration of a myoma, carcinoma and myoma of the body of the uterus, and myoma of the uterus and carcinoma of the cervix. Of the first class 10 cases are recorded, only 4 appearing trustworthy as to the carcinoma being

¹ N. Am. Practitioner, March, 1895.

² Gaz. méd. de Paris, No. 48, 1893.

³ Centralbl. f. Gynäk., No. 26, 1894.

⁴ Ibid., No. 14, 1894.

primary. Of the second class there are 23 reported cases, in only 2 of which was the disease secondary in the myoma, and in both the myoma was submucous. Of the remaining class 13 cases are recorded. There is no evidence that the myoma of the body is ever the cause of carcinoma of the cervix, but, like many other morbid conditions, it renders the uterine tissues unhealthy, and either predisposes them to carcinoma or at least causes the malignant disease to be especially grave when once established. Operation for carcinoma of the cervix with myoma of the body has proved fairly successful, vaginal removal being preferred by most operators, even when the uterus is as large as a child's head. Abdominal hysterectomy has not proved satisfactory because of the theoretic danger of fouling the peritoneum by the carcinomatous mass. The extent to which this occurs depends, of course, upon the skill of the surgeon.

[In the matter of the treatment of fibroid tumors gynecologists are sadly at variance. The operations most in favor for the radical cure of myomatous growths are four: Suprapubic hysterectomy, enucleation through the vagina or by abdominal section, ligation, and castration. Of these, hysterectomy by the suprapubic method in association with the improved technique—the retroperitoneal or subperitoneal treatment of the pedicle, as suggested primarily by Chrobak—is more than holding its own; in fact, it is steadily gaining ground, and the extraperitoneal method has either largely failed into disuse or is practised only by its originator and a few adherents. The mortality of total abdominal hysterectomy and the amputation method with dropping the stump, in the hands of such men as Martin, Krug, Baldy, Baer, and Polk, has fallen to considerably under 5 per cent., and as experience in the management of these cases grows there is no reason why it should be looked upon as a more serious operation in any respect than simple ovariectomy. While it is true that hysterectomy is a mutilating operation when viewed from the standpoint of the conservative surgeon, still it must be admitted that such an operation is perfectly justifiable in those cases in which the tumor is very large, involving the body of the uterus, or when the organ is the seat of a number of large tumors not amenable to treatment by enucleation or by castration. The preservation of the vaginal portion of the cervix in this operation, whenever this may be possible, is preferable to complete enucleation, from the fact that there does not follow the serious distortion of the vaginal vault and the complete removal of support to the floor of the peritoneal cavity that are observed after total extirpation. The prediction of Swain,¹ that hysterectomy with the subperitoneal treatment of the stump “will become more popular, and that as the clamp in the treatment of the ovarian pedicle has disappeared into the limbo of the past, so also will the *serre-nœud* in hysterectomy,” is already realized.]

Mangiagolli,² on the other hand, considers that the importance of the treatment of the pedicle in the prognosis of hysteromyomectomy has been greatly

¹ British Med. Jour., July 21, 1894.

² Transactions XI. Internat. Med. Cong., Am. Jour. Obst., Aug., 1894.

exaggerated. Statistics show that the mortality of the operation is progressively decreasing, whatever the method used, and that each method claims magnificent results. There are conditions, both general and local, that he thinks are deserving of more attention than the treatment of the pedicle. Among these may be mentioned, as of prime importance, the intraligamentous development of the tumor, which increases the gravity of the prognosis in proportion to the volume of the tumor. In a consideration of the results obtained by the various methods it is essential to make a distinction between fibromata that develop within the ligaments and the other varieties of fibroma—subserous, submucous, and interstitial. In this second class the mortality is about 5 per cent. by both methods, and it is not likely that this prognosis would be improved by total ablation, whether abdominal or abdominovaginal. In the majority of cases the endoperitoneal method is the one to be preferred, as it has been proved that a lower death-rate is obtained with an avoidance of some of the drawbacks of the extraperitoneal method. As a rule, preference is to be given to Zweifel's method because of its simplicity and rapidity. Intraligamentous fibromata show a high mortality, and the question of the method to be used is of importance. Total ablation by the abdominal method might be valuable. During the past six years the author had performed eighty hysteromyomectomies, using all methods, and had a mortality of 13.7 per cent.

Zweifel's¹ method of treating the stump is as follows: After ligating and dividing the upper portions of the broad ligament, the usual peritoneal flaps are dissected from the uterus. The cervix is then ligated in sections, and the mass is excised without much loss of blood. Finally, the stump is covered with peritoneum by suturing the anterior and posterior flaps. The cervical canal receives no special treatment with the view of destroying septic germs, except in the case of sloughing tumors. Occasionally, if hemorrhage is feared, a temporary elastic ligature is applied, which is removed after the stump has been ligated. The mortality in 92 cases thus treated was only 3.2 per cent. The comparative mortality by different methods in the hands of various operators Zweifel estimates as follows: The method adopted by Schröder, Martin, Leopold, and others, 25.6 per cent.; the use of the elastic ligature, as practised by Olshausen, Fritsch, et al., 24 per cent.; ligation and extraperitoneal treatment of the stump, 5.2 per cent. This statement is somewhat at variance with that made by Martin² himself, who remarks that, having in 1888 decided to do away with the pedicle, as a source of hemorrhage and infection, he substituted total ablation of the uterus for supravaginal amputation. This he first performed by the abdominal method, leaving a drainage-tube in the peritoneal cavity; the mortality was over 30 per cent. After suppressing drainage the mortality fell to about 9 per cent.; and, finally, in a later series of cases it dropped to 3.84 per cent., due to the following procedures: (a) scraping and disinfection of the vagina and uterine cavity; (b) abdominal section; (c) lifting out of the uterus; (d) ligature and section of

¹ *Centrabl. f. Gynäk.*, No. 14. 1894.

² *Am. Jour. Obst.*, Aug., 1894.

the broad and round ligaments to the cervix; (*e*) opening of the posterior fornix; (*f*) suture of the vaginoperitoneal border; (*g*) excision all around the cervix and completion of the suture; (*h*) the placing of threads of suture in the vagina and closure of the peritoneum. By this method Martin operated upon 26 women and cured 25.

Demetrius¹ describes a method of intraperitoneal treatment of the stump that closely simulates Leopold's method, and which in his hands was attended with a mortality of 4.3 per cent. in 24 cases. He cures the uterus and cauterizes the cervical canal as a preliminary step. In ligating the uterine arteries a portion of the uterine tissue is purposely included on either side, which, he claims, not only serves as an efficient safeguard against hemorrhage, but renders the elastic cord superfluous. If there is much bleeding from the stump, it is transfixed on both sides, the ligatures being passed through the tissue just without the cervical canal from before backward. If the stump is large, other ligatures may be used, but as none of these encroach upon the canal, it is left open for drainage, which is favored by the introduction of a strip of gauze; the raw surfaces, however, are not covered with the gauze. The peritoneal folds are simply allowed to fall together without being sutured.

Enucleation of a fibroid tumor is an operation of necessarily limited scope. It can be employed only in the case of subperitoneal or interstitial growths, and then only when there is but a single myofibroma or a limited number of the tumors, especially if these be situated between the cornua or in the anterior wall of the organ. The operation may be performed through the vagina or after abdominal section. Montgomery² calls attention to the fact that the vaginal operation was first suggested by Langenbeck as early as 1813; it consists in cutting through the vaginal vault and pushing off the uterine and connective tissues from the fibroid tumor, which is thus shelled out of its capsule, without rendering ligation of the vessels necessary. Enucleation of the tumor by abdominal section, or Martin's operation as it is

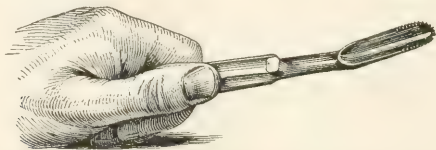


FIG. 35.—Eastman's curet or spoon (Am. Jour. Obst., May, 1894).

termed, is followed by closure of the cavity by deep buried sutures, the peritoneum being united over the deeper sutures. Eastman³ during the last four years has been endeavoring to reduce to the minimum the number of ligatures in this operation. To aid in the process of enucleation he has devised

¹ Centralbl. f. Gynäk., No. 26, 1894.

² Med. News, Aug. 18, 1894.

³ Am. Jour. Obst., May, 1894.

a saw-like knife (Fig. 35) with which, after the fundus is fixed, he proceeds to separate the tissues, tying only the ovarian artery on either side and then tearing off the remaining tissues. The hysterectomy-staff is then introduced into the vagina, and the vaginal tissues are punctured into the groove of the staff, and through this opening is passed a strip of iodoform-gauze; the flaps of the capsule are folded and united with silkworm-gut so as to secure sero-serous approximation with drainage into the vagina.

Péan's operation, or what he has termed the *perineovagino-rectal method*, for the removal of large interstitial fibromyomata of the body of the uterus is an interesting modification of the operation of vaginal enucleation. In such cases, in order to secure room for the removal of the large mass, Péan¹ divides the perineum and septum in the median line down to the peritoneum, a clamp being applied on either side of the line of incision. The tumor is then seized, drawn down, and removed piecemeal, care being taken to preserve the uterus if possible. The cavity is drained by means of a large rubber tube and packed with pledgets of iodoform-gauze to which long silk threads have been tied. The vaginal and rectal mucosæ are united with continuous catgut sutures, after which the perineal incision is closed. Péan considers this method superior to the ischiovaginal (lateral incision between the vagina and ischium) and sacral methods. Even large tumors reaching the level of the umbilicus may be removed by this method with the aid of morcellement.

Total extirpation of the fibromatous uterus, or celiohysterectomy, as it has been very appropriately termed when performed through an abdominal, or kolpohysterectomy when through a vaginal, incision, has claimed for itself a fairly large proportion of eminent followers, who assert that it has yielded the best results of any method extant. With the patient in Trendelenburg's posture the time required to perform the operation is no longer than that required in making many of the difficult abdominal and pelvic operations now being performed daily. After ligating off the ovaries and dividing the broad ligaments the peritoneum is divided across the front of the tumor just above the top of the bladder and across the back of the tumor somewhat lower down. The peritoneum is then stripped down in front of the bladder and separated from the tumor down to the vagina. After stripping the peritoneum from the back of the tumor the uterine arteries and their branches are easily secured. The ligatures are placed between the two flaps of the peritoneum, but do not include this membrane in their grasp. The number of ligatures does not usually exceed two or three on either side. One end of each should be left about six inches long, and, after removal of the cervix, carried out through the vagina to be cast off through that passage. The vagina is lightly packed with gauze, and the peritoneal edges which were stripped from the tumor are turned in toward the vagina and neatly coapted by a running stitch of catgut. The wound in the vagina is treated as after an ordinary vaginal hysterectomy. The advocates of this method claim that

¹ Le Bul. méd., No. 28, 1894.

owing to ligation of the broad ligaments in sections instead of *en masse*, as in ovariectomy, the danger of secondary hemorrhage is materially less than in the latter operation. The danger of wounding the bladder or ureters is, they say, reduced to a minimum, since these organs are lifted with the anterior peritoneal flap well out of the field of operation.

In dealing with large intraligamentous fibromata Pryor¹ would modify the usual technique by securing the ovarian and uterine arteries on the side of the uterus on which the tumor is *not* intraligamentous. The uterus is then amputated below the internal os and the tumor enucleated from below. As each vessel comes in view during the enucleation it is grasped by a pair of forceps and subsequently ligated. [This method greatly simplifies these heretofore most difficult and dangerous operations, and much credit is due the author for introducing such an improved technique.]

Edebohls² groups the methods of vaginal hysterectomy as follows: 1. The *German method*, or *serial ligation of the broad ligaments*, which presents the serious objection of unnecessary constriction of vital tissues richly supplied with nerves, blood-vessels, and lymphatics; 2. The *French method*, or the use of the *clamp* as advocated by Péan, which Edebohls considers as entirely unsurgical; 3. *Pratt's method*, or enucleation with ligation of bleeding vessels only; ligation is required merely to check hemorrhage, and this object can be accomplished by simply tying the bleeding vessels.

Ligation of the uterine arteries through the vagina, as proposed by Martin³ and also by Gottschalk,⁴ is indicated in only a limited number of cases, including those of interstitial tumors of moderate size, and in which the patient has become so exhausted by repeated hemorrhages that a radical operation could not be endured. Rydygier,⁵ who in 1889 and 1890 advocated this operation in all cases of uterine myomata, now prefers extirpation of the tumor except in cases in which strong contraindications make the radical operation inexpedient. Goelet,⁶ on the contrary, has found the operation very successful for the control of uterine hemorrhages and the reduction of the size of the fibroid growths. The only danger, he claims, is the risk of including the ureters in the ligatures, these structures passing down behind the uterine arteries but half an inch from the cervix, and consequently lying in the field of operation. To eliminate this risk he suggests as a preliminary step the passing of bougies into the ureters through the bladder. The objects of vaginal ligation, as set down by Martin⁷ himself, are: 1. By a comparatively simple procedure to deprive an abnormally over-nourished uterus of the bulk of its blood-supply by ligating the main channel and trunks of the uterine arteries. 2. To still further deplete the uterus in desperate cases by including, when practicable, not only the uterine arteries of both sides, but also the ovarian artery of one side. 3. To cut off the nutrition of the uterus

¹ Med. News, Dec. 1, 1894.

³ Am. Jour. of Obst., vol. xxvii., No. 4, 1893.

⁶ Ibid., No. 13, 1894.

² Am. Jour. Med. Sci., Jan., 1895.

⁴ Centralbl. f. Gynäk., No. 39, 1893.

⁶ Am. Medico-Surg. Bull., June 1, 1894.

⁷ Jour. Am. Med. Assoc., Aug. 11, 1894.

by ligating a large proportion of its nerve-communication as well as its blood-supply.

[Castration for the relief of uterine fibroids, performed for the purpose of bringing on an artificial menopause, has fallen somewhat into disuse, although its results in a selected class of cases were good. The furore excited by the advent of the improved technique of hysterectomy, with its lessened death-rate, is probably responsible for this. The operation is especially serviceable in those cases in which the hemorrhages are alarming in their frequency and quantity.]

The question of the substitution of myomectomy for hysterectomy has agitated [unnecessarily, we venture to suggest] the minds of a number of operators. E. C. Dudley¹ is probably the most earnest advocate of this operation at present. He insists that the appendages should be saved whenever practicable, but admits that there are certain conditions in which the myomectomy must be supplemented by the removal of the appendages. [The pathologic state of the uterine mucosa that is invariably present in fibroid disease of the uterus is the strongest argument in opposition to the retention of the uterus in the treatment of this condition.]

Operative and Postoperative Complications.—Probably the most frequent accident encountered during the performance of a hysterectomy is *traumatism of the ureters*. These structures may be included in the ligature and their lumen obliterated, or they may be severed or a portion of their structures removed with the pathologic growth. Penrose² reports an instance in which the ureter was resected and immediately implanted into the bladder without subsequent inconvenience to the patient. Krug also reports another case. This method of transplantation of the severed ureter into the bladder is undoubtedly the proper course to pursue under these circumstances, and, according to Baldy,³ the surgeon will in future not be justified, in the face of a severed ureter, in making an artificial fistula or in removing the kidney. Another but less preferable method of treatment is the uniting of the two ends of the vessel. Bache Emmet⁴ has recently reported such a case. *Injuries of the bladder and bowel* are of frequent occurrence, but of slight import if immediately corrected.

The cause of the *intense thirst* that is invariably present after abdominal section has been well investigated by Boise.⁵ He concludes that it is not due to the use of the anesthetic, nor is it dependent upon the length of time occupied by the operation. There may have been no hemorrhage nor any other agency by which fluid has been removed from the body. No other operation occupying an equal length of time and giving rise to an equally small amount of hemorrhage will cause such distressing thirst. The cause must, therefore, he decides, be connected in some way with the incision of the peritoneum and the consequent intraabdominal exposure and irritation, and

¹ Am. Jour. Med. Sci., July 1, 1894.

² Ther. Gaz., Aug. 15, 1894.

³ Am. Gyn. and Obst. Jour., Nov., 1894.

⁴ Am. Jour. Obst., April, 1895.

⁵ Ibid., No. 4, vol. xxx., 1894.

he bases this theory upon the following physiologic facts which are universally accepted or have been experimentally proved: 1. Thirst is a sensation indicating that the tissues of the system need more water. 2. The sensation felt in the throat is reflex. 3. The origin of the sensation is believed to lie in the sympathetic system of nerves, and probably comes from the abdominal organs, because these are so rich in sympathetic fibers, and introduction of water into the stomach so instantaneously allays thirst. 4. Capillaries tend to remain at normal tension, and, when suddenly collapsed in any degree, attempt to regain that tension by taking water from the surrounding tissues. 5. Irritation of sympathetic nerves causes contraction of the arterioles supplied by such nerves. 6. Sudden contraction of the arterioles supplying any organ is followed by lessened tension in the capillaries and small veins of that organ. 7. Abdominal section invariably causes direct and reflex irritation of the abdominal sympathetic nerves, and such irritation causes contraction (in some degree) of the arterioles of the abdominal viscera, with consequent lessened tension in their capillaries and compensatory withdrawal of water from their tissues.

Boise,¹ likewise, enumerates as factors in the causation of *suppression of urine after abdominal operations*: 1. The direct irritation of the abdominal vessels by the mere opening of the abdominal cavity, aggravated to a greater or less extent by the more or less severe reflex irritation of the renal plexus by injury to other parts of the abdominal sympathetic. 2. That condition known as shock, in which the contraction of the renal and other abdominal arteries exists conjointly with general arterial contraction and consequent venous engorgement, in which case there is not only lowered blood-pressure in the renal arteries, but retarded velocity through the renal capillaries because of venous obstruction. 3. The direct depletion of the blood and consequent lowering of the blood-pressure by the removal and withholding of fluids. 4. The problematic irritant effect of the anesthetic. The indications for treatment are: 1. To avoid the possible irritant action of ether by refraining from saturating the patient beyond the point of necessary anesthesia. 2. To replenish the blood-vessels by the free administration of hot water, preferably by the rectum. 3. The relaxation of arterial contraction by the use of codein or nitroglycerin.

Phlegmasia alba dolens, according to Baldy,² is a rare complication of abdominal section, although about a dozen cases have been reported during the past eighteen months. He is unable to make any positive statement as to its causation. The attack begins, as a rule, about the close of the third week after operation, and follows a typical course. It cannot be traced to a septic origin, and is to be attributed to a nonseptic thrombosis or to an embolus, probably the former, from the fact that the trouble begins in the hip and extends downward. It is always unilateral, and is for the most part confined to the left leg.

The question of the administration of *opiates after abdominal section* is one

¹ Ann. Gyn. and Ped., Dec., 1894.

² N. Y. Jour. of Gyn. and Obst., March, 1894.

that has been variously decided by eminent operators. Price, Penrose, Ross, and others are strongly opposed to opium in any form, while Baer, Goodell, and others are in favor of its use in a limited class of cases. Boise¹ asserts that there are many cases in which "the use of an opiate after section is not only good treatment, but is demanded by the best interests of the patient. The more severe the operation, the greater the shock, the more intense the colic, and the more threatening the condition of intestinal paresis or obstruction, the greater is the benefit of an opiate." He prefers codein in those cases in which an opiate is indicated.

Nonoperative Treatment.—[The theory of the advocates of this method of dealing with fibroid tumors—namely, that at some time of their life all forms of uterine myomata are amenable to medical treatment—is confronted by the deplorable fact that rarely do these tumors come to their notice at this favorable moment. The electric treatment is rapidly assuming its proper level, and the period of electromania may be said to have lapsed. Even by its former staunchest supporters it is no longer regarded as a curative, but as a valuable remedial agent, and especially as a hemostatic.]

Condamin² has adopted successfully the following course of treatment in the case of fibroids that give rise to no symptoms except leukorrhœa and moderate hemorrhage: Pencils of zinc chlorid (from 50 to 33 per cent.) are introduced into the uterine cavity after previous dilatation and irrigation. The cervix is then tamponed with gauze, and the patient lies on her stomach for three or four hours afterward, being kept in bed for eight or ten days. The sloughs separate on the tenth or twelfth day. The patient has considerable pain and a temporary elevation of temperature. The writer reports twenty cases in which the most satisfactory results followed the treatment.

THE UTERINE APPENDAGES.

Microscopic Anatomy of the Fallopian Tubes.—There is but little new to be recorded in our knowledge of the anatomy of the tubes. Probably the most important contribution of the year is Köstlin's³ paper on the terminations of nerves in the female genital organs. From extended microscopic observations on the lower animals as well as in the human subject he has determined the following points: In the Fallopian tubes of sheep there are but few nerves in the mucosa and no plexuses. The nerve-fibers are either distributed directly to the epithelium or first enter the extremities of the mucous folds and then terminate in the cells, while their ultimate terminations in the epithelia are as yet undetermined. Triangular ganglion-cells are found in considerable numbers in the mucosa, from which extend many fibers thicker than the others and not so tortuous, that sometimes anastomose with other neighboring processes and can be traced directly to the

¹ N. Y. Jour. of Gyn. and Obst., March, 1894.

² Lyon méd., May 28, 1893.

³ Fortschritte der Med., No. 11, 1894.

epithelia. In the tubal mucosa of pigs there is a rich anastomosis of nerve-fibers, with finer branches that can be followed into the epithelial cells, though it is impossible to discover their ultimate terminations.

Varieties of Salpingitis.—Under the name of *salpingitis nodosa* Wertheim¹ designates the form of tubal hypertrophy described by Schauta and Chiari as the incipient stage of chronic salpingitis. It is characterized by the presence of nodes in the tube-wall varying in size from that of a pea to a hazelnut. They are always found in relation with the proximal third of the tube, and are associated with inflammation at the ampulla and other portions of the genital tract. These nodes were formerly believed to be fibromyomata, but Chiari, through careful microscopic examination, found that the form of growth was not constant, but that the greater number were due to inflammatory hyperplasia of the muscular wall of the tube. The columnar epithelium of the tubal mucosa is usually intact. Frequently, as the disease advances, the tubal lumen becomes narrowed at short intervals, and finally numerous small cysts are produced—*follicular salpingitis*. Wertheim's case differs from those described by Schauta and Chiari in that the nodes, which were of the size of small walnuts, were found on section to be small abscesses containing thick yellow pus. On the right side each abscess communicated with the uterine cavity by means of a minute canal. The tube-canal on both sides was filled with pus and the ostium closed.

From a pathologic standpoint Penrose and Beyea² divide tuberculous salpingitis and peritonitis as follows: 1. Primary chronic diffuse tuberculous salpingitis. 2. Primary chronic fibroid tuberculous salpingitis with calcification. 3. Secondary tuberculous peritonitis, the primary lesion being in the Fallopian tube. 4. Secondary chronic fibroid tuberculous salpingitis with calcification. The characteristics of the first are that the mucosa is partially or completely replaced by innumerable miliary tubercles surrounded by an extensive small round-cell infiltration, and that large areas of caseation are very frequently seen. Caseation becomes more marked as the lumen and the distal two-thirds of the tube are approached. The muscular wall of the tube may be infiltrated to a greater or less degree. This form would represent tuberculous pyosalpinx. The second form differs from the first in that considerable fibrous tissue is seen within and around the tubercles, and that small round-cell infiltration is very small in amount and uniformly distributed in all parts of the tuberculous tissue; also, that caseation is very rarely seen or is absent, and calcification very frequently occurs. The disease in this form may be limited to a portion of the tube. The characteristics of the third form are apparent and well known. The fourth form does not differ pathologically from the second. Five cases are quoted. The specimens from 4 of the cases consisted of one or both tubes and ovaries, and in 1 case the uterus. In 2 of the 4 cases the tuberculous salpingitis was bilateral. The ovaries were involved in the tuberculous process in only 1 case. In the only instance in which the uterus constituted

¹ Centralbl. f. Gynäk., No. 18, 1894.

² Jour. Am. Med. Sci., Nov., 1894.

part of the specimens it was the seat of chronic fibroid tuberculous endometritis. This form of tuberculous disease of the uterus is mentioned as being possible by Williams, but he reports no case. In all 4 cases the parovarium was affected by the tuberculous processes. As far as is known, tuberculosis of the parovarium has never been mentioned. As regards these four cases, the order of frequency of tuberculosis in the female genital tract is as follows: Tubes, parovarium, uterus, ovaries. The fifth case was interesting in that the peritoneum was infected from a chronic fibroid tuberculous salpingitis, giving an instance in which this form of tuberculosis was not a conservative process. Considering the frequency of unsuspected and suspected primary tuberculosis of the female genital tract and its termination in tuberculous peritonitis, as shown by Williams and in the cases quoted, Penrose and Beyea think that it is very probable that tuberculous peritonitis in women has its origin in the female genital tract far more frequently than statistics show and is generally supposed. Should all organs found to be tuberculous at autopsies on women dying of tuberculous peritonitis be subjected to microscopic examination, thus determining which of the lesions are the more chronic, they believe much would be learned.

Tuberculous peritonitis and salpingitis, Stehégoleff¹ declares, may be cured by abdominal section, provided the operation is performed at the beginning of the trouble. If it be performed late in the disease, a cure can no longer be secured, though life may often be prolonged. It is thought that the curative action of a section is due to a combination of the peritoneal traumatism during the operation, thermic influence, penetration of air into the abdominal cavity, and, perhaps, the action of light. An inflammatory deposit, more or less intense, follows, and this is indispensable for the arrest of the morbid process. The inflammatory reaction is characterized by an infiltration of embryonic cells, phagocytosis, and an active development of the endothelial cells. This new tissue organizes, and the specific elements of tuberculosis perish or are absorbed. That evacuation of the liquid is not necessarily the cause of the cure is shown by those cases that recover after section in which no liquid was found at the time of the operation.

Mannotti and Baciochi² have conducted a series of experiments on rabbits and dogs with a view of determining the influence of explorative abdominal section in tuberculous peritonitis. In rabbits improvement was commonly noted, but never a cure; in dogs a cure was the rule. The tubercles were absorbed and were transformed into connective tissue; the absorption was apparently secondary to destruction of the virus and vascular new formation, and was most marked in dogs. In consequence of the transformation of tubercles into connective tissue, troublesome intestinal adhesions are liable to form. It is only by reopening the abdomen that one can determine positively the value of abdominal section in these cases. Though most of the tubercles are rapidly absorbed, some are slow to disappear; hence it is neces-

¹ Arch. de Méd. Experiment. et d'Anat. Patholog., Sept. 1, 1894.

² Archiv f. Gynäk., Bd. xlvii. H. 1.

sary to be careful in pronouncing a patient as entirely cured even when the clinical symptoms are favorable. The beneficial effects of abdominal section do not seem to be more marked when the peritoneal cavity is irrigated with sterilized water or antiseptic solutions. Mannotti and Baciochi conclude that in animals, opening the abdomen causes a certain inflammatory reaction of the peritoneum, accompanied by a marked increase of its absorptive power, which results in a prevention of further infection, degeneration of cells, vascularization of tuberculous nodules, and finally their absorption and transformation into connective tissue.

Gonorrheal Salpingitis.—Walton¹ refers to a latent form of gonorrhea in which the organism is saprophytic, and which exists in the male as well as in the female. This latent organism, through an exciting cause, manifests itself when a favorable culture-medium is present, and thus it is that in the female the different uterine and adnexial inflammations are produced. A pyosalpinx is commonly caused by a mixed infection of gonococci and pyogenic organisms, and this mixed infection can only be found early in the case, since the gonococci are later overpowered by the pus-cocci. The gonococci tend to migrate from the vagina into the cervix, and thence into the uterine cavity; the tubes are infected by uterine contraction or some therapeutic measure.

Diagnosis of Pelvic Inflammatory Disease.—[The profession at large is awakening to the fact that a very large proportion of tubes and ovaries are annually uselessly sacrificed either to an absolute inability on the part of the operator to recognize the true condition that is present or to a culpable neglect on his part to accomplish an absolute diagnosis.] In support of this statement may be quoted the assertion of Howard Kelly² that 15.5 per cent. of the last 200 cases sent him for operation had no pelvic disease; that of Doléris,³ who, in speaking of the abuses of castration, says that in over 5000 operations performed in France it is his conviction that in eight-tenths of these this radical operation could have been avoided; also, that out of about 300 cases personally observed in three years he found about 50 in whom castration might have been reasonably practised. This recalls the statement of Tait,⁴ who in a lecture given before a learned association described a visit he paid to one of his ardent disciples, who triumphantly brought out in bottles two dozen appendages which, in almost every instance, were free from guile. Williams⁵ of Baltimore says: "For the last three or four years I have received a large number of tubes and ovaries in Baltimore—in fact, I have received all that were removed by five different operators—for examination, so that I am able to say what few other men can, that a very considerable number of the operations are performed absolutely with no justification. As the result of my work, covering at least 300 tubes and ovaries, I believe that in at least 5 per cent. of the cases there was absolutely no

¹ *Centralbl. f. Gynäk.*, No. 14, 1894.

² *Ann. of Gyn. and Ped.*, Jan., 1894.

³ *Nouv. Arch. d'Obst. et de Gynéc.*, vol. v. p. 401.

⁴ *Lancet*, Feb. 7, 1891.

⁵ *New York Jour. of Gyn. and Obst.*, Aug., 1893.

anatomic ground for removing them." He also states that he has seen a considerable number of young women who have had their ovaries removed for dysmenorrhea, and in the vast majority of these cases there was no reason for it. With such an array of figures in mind, Kelly¹ urges the importance of careful exploration through the vagina and bowel and over the lower abdomen under anesthesia. For this purpose he suggests what he terms the *trimanual method of examination*, by rectum, vagina, and abdomen, and which consists in the employment of a tenaculum, which is hooked into the anterior lip of the cervix for the purpose of pulling down the uterus with its appendages into the reach of the examining fingers. The tenaculum being flat and corrugated on the handle makes it easy for the vaginal hand to grasp and hold it firmly during the examination. If resistance be felt at any point, the traction must not be carried farther until its cause is ascertained. Examination of the pelvis through the vagina and bowel can be much more thoroughly made by this maneuver. In doubtful cases the ovaries may be detected by means of the uteroovarian ligaments, always recognizable as prominent cords in the broad ligament immediately below the cornua uteri. Upon running the finger out one of these cords for from one-half to one inch it comes in contact with an abrupt enlargement, which is always the ovary. If this be large, ill-defined in outline, and more or less fixed, the diagnosis of inflammatory disease may be made at once. In order to exclude inflammatory conditions the finger must be passed around the ovary, clearly outlining its border and surfaces as it is lifted on the palpating finger. In this way the most delicate adhesions will be discovered. He also suggests² a procedure for overcoming the embarrassment experienced by the crowding of the small intestines down into the pelvis, and the consequent liability of making a false diagnosis of pelvic disease. Coils of small intestines in the pelvis containing fluid often feel tense and fluctuating, and thus readily impose themselves upon the examiner as large cystic ovaries or leave him in doubt as to their true nature. The complete removal of these impediments may be satisfactorily effected in the following manner: The patient is placed in the knee-chest posture, with the shoulders on the table, and hips high, and the thighs vertical. The anal orifice is opened by a small speculum or tube, allowing the air to rush into the rectum. The explanation of this phenomenon is that, upon assuming the knee-chest posture, the small intestines gravitate along the anterior abdominal wall into the upper abdomen toward the diaphragm, creating a suction at the most elevated portion, which is the pelvic extremity, by means of which the whole ampulla and rectum balloon out with air as soon as the anus is opened, and the distended rectum applies itself broadly over the posterior surface of the uterus and left broad ligament. Before making such an examination both rectum and bladder must be thoroughly emptied. Immediately after filling the rectum with air the tube is removed, the patient is placed in the ordinary dorsal position with the limbs flexed upon the abdomen, and the bimanual examination is made through

¹ Loc. cit.² Am. Jour. of Obst., May, 1894.

the rectum and over the abdomen. The index finger introduced within the anus at once experiences the sensation of entering a large cavity filled with air, in which the customary resistance is absent. The communication with the upper bowel between the uterosacral folds is, under these circumstances, readily found, and the finger is conducted behind the broad ligament, when, on using the external hand in assistance, the uterus, broad ligaments, ovaries, and tubes are at once palpated directly through the rectal wall, without resistance and with startling distinctness. The true pelvic viscera, thus seen, as it were, to be skeletonized in the pelvis, lie so clearly exposed to touch that the minutest surface peculiarities, fissures, elevations, and changes in consistence can be detected, and a diagnosis made more satisfactorily, more rapidly, and with far less effort than under ordinary conditions.

The Conservative Treatment of Pelvic Disease.—[The abuse of castration, as already described, has resulted in quite a reaction among gynecologists in favor of the so-called *conservative treatment* of the female pelvic organs—a reaction that was participated in by many eminent operators; a reaction, however, which was carried too far, and against which a reaction has again set in. The various processes that have been suggested in place of complete extirpation of the annexes may be stated as follows: 1. After abdominal section: Partial extirpation by one of the following methods: (a) Partial resection of the tubes and ovaries, with cutting or tearing of the adhesions, and replacing of the portions so treated within the abdomen; (b) Partial amputation of the tubes, with return of the healthy portion to the abdomen; (c) Partial resection of the diseased portions of the ovary, the cut edges, if healthy, being brought together and stitched, or ignipuncture of the ovary if cystic, and fixing the ostium of the tube to the ovary; (d) Martin's method, consisting, also, in resection of the ovary in like manner, but without ignipuncture, resection of the diseased portion of the tube, and the formation of a new ostium; (e) Salpingotomy; that is, removal of a small piece of the tube, and bringing of the parts together (in cases of hydrosalpinx). 2. Treatment carried on through the vagina or rectum: (a) Pelvic massage, which, according to Jentzer,¹ need not be discontinued during menstruation, the sittings, however, at that time being of very short duration and the movements being those that oppose congestion; (b) Dilatation and curettage of the uterus; (c) Catheterization and aspiration of the Fallopian tubes for the relief of abscesses; (d) The special treatment of gonorrheal cases by electricity; (e) The use of uterine drainage.]

The method of partial extirpation, as practised by Polk, is as follows: He removes all tubes distended with mucopus, blood, or serofluid, even to the very cornua uteri, but recommends retention of the tubes in thickening after acute inflammation unless the uterus be the cause, when the latter must be cleansed, curetted, and packed with gauze. If the tube be not distended and is closed by recent lymph, he opens it, approximates the outer and inner coats, washes it out with plain water, and returns it to the pelvis. [To ap-

¹ Centralbl. f. Gynäk., No. 17, 1894.

preciate the impossibility of carrying this procedure out, it is only necessary to call attention to the fact that in such cases it is absolutely impossible to bring the inner and outer coats together with sutures, and almost if not equally impossible to wash out the cavity of the tube. It is also well to observe that if the tube contain infective matter it must be exceedingly dangerous to open it up and return it to the pelvic cavity.] If the ovaries be sufficiently diseased, he removes them, but if the tube alone is the seat of disease, the ovary is left. Adhesions are cut or torn away, thus permitting the organs to regain their integrity. Cystic ovaries are treated by ignipuncture if the cysts are small; with larger cysts, by enucleation and subsequent cutting away of portions by a V-shaped incision. [Breaking up the adhesions by no means necessarily implies a cure, as the disease rests in the ovarian and tubal tissues as often or even oftener than in the adhesions; again, it by no means follows that the organ will not readhere; in fact, there is great danger of this. Puncture of small cysts usually does little good, as the symptoms arise most commonly from the interstitial disease, and not from the cysts.] Barrows's method of resection or amputation of the tubes consists in the cutting off of the diseased abdominal end of the tube, the apparently healthy portion being returned to the pelvic cavity. In certain cases of pyosalpingitis the tube may be amputated at some distance from the cornu of the uterus, and the formation of an artificial ostium abdominale may be so completed. In some instances Barrows has noticed that the tube that contains the pus is closed, firstly, at the extreme end of the infundibulum by adhesions to surrounding parts—ovaries or intestines, and that, secondly, it is also closed at a point about half an inch to an inch or more in length from the uterine cornu. It is in this sac that the pus accumulates. In the inner portion of the tube the aperture is patent, and any pus there formed is discharged by the uterus; but far more frequently neither the mucous, serous, nor muscular coats of this portion are inflamed. It is in these cases with a healthy ovary, without adhesion thereto of the fimbriated extremity of the tube, that he amputates the healthy portion of the tube, washes it and slits it up a little way, and unites the serous and mucous coats thereof by fine catgut ligatures, bringing the new ostium thus formed in close apposition to the ovary. Barrows claims excellent results by this method. [The principles of this procedure are precisely the same as those of Polk, and the same criticisms hold good. The practice is not only a useless one, but absolutely dangerous.]

Pozzi's method of partial resection of the ovary, or of salpingostomy, is indicated in hydrosalpinx with relative integrity of the ovary, in cysts but the size of a pea, or in an intact and permeable tube with diffuse sclerotic ovaritis or with microcystic degeneration. The plan originally adopted by Pozzi was, first, having ascertained that the tube was perfectly permeable by a stylet down to the uterine cavity, the ovary was seized and a piece of it removed by a cuneiform section. The parts were then brought together by catgut sutures. If the ovary be affected with microcystic degeneration, and

any portion of it (and frequently the hilum is intact) be not so affected, it is spared, and the diseased portion alone removed; then the ostium of the Fallopian tube is fixed upon the ovarian stump by a few points of suture (salpingorrhaphy), and thus placed in position to receive the ova. More recently Pozzi has still further modified his *modus operandi* by opening all of these small cysts with the knife or actual cautery, which in itself often causes an energetic melting away of the chronic inflammation.

[*Catheterization of the Fallopian tubes* is possible only in an exceedingly limited number of cases, if at all, as must be evident from a consideration of the size of the internal ostium of the tube in the normal female. Anatomists state that the uterine orifice of the tube will barely admit a bristle, although Carr¹ has seen three cases in which, during the passage of a sound into the uterus, it has passed into one of the Fallopian tubes. These cases, however, are more easily explained on the theory that the sound perforated the uterine walls and thus passed into the abdominal cavity—a not uncommon accident. Aside from this anatomic reason, the only suitable cases, even according to Carr, for this mode of treatment would be very limited in number, comprising acute salpingitis with fluid or pus in the uterine extremity of a tube of abnormally large caliber, held there by recent adhesions, or by a soft plug of inspissated mucus or pus. Even could it be accomplished, the dangers of the operation are imminent, and would include the introduction of germs that might prove more virulent than those already in the tube, the perforation of the tube or uterine wall, the forcing of pus through the outer end of the tube into the peritoneal cavity, and the production of hemorrhage by the tearing of loose adhesions during the necessary manipulation of the uterus. Finally, in the majority of cases repeated catheterizations would be necessary to accomplish any good, the course of treatment continuing for months or years, while the pain and adhesions persist indefinitely. The only apparent good that could follow this mode of treatment is, in acute cases with grave symptoms, the delay of abdominal section until the conditions for operation were more favorable.]

[*Uterine drainage after curetment* has undoubtedly given good results in a certain number of cases, and of all the methods of conservative treatment of the adnexa it is probably the most satisfactory and the safest. Experience, however, has conclusively demonstrated that those cases “in which gentle pressure upon a pyosalpinx after curettage will cause a flow of pus through the uterine extremity of the tube into the uterus” are very rare, while Baldy, Coe, Noble, and others claim that such a thing is impracticable or even impossible, and Chrobak² says that an attempt to press the pus-contents of the tubes into the uterus should be condemned as too dangerous a procedure. It must also be remembered that intrauterine curetment in the presence of an acute, or even a chronic, pyosalpinx may very readily be instrumental in kindling a peritonitis from tubal rupture that may very quickly destroy the patient. Then, again, the gauze often acts rather as a

¹ Am. Jour. of Obst., Oct., 1894.

² Wiener klin. Woch., vi., 49, 1893.

tampon than as a uterine drain, and may just as readily defeat as accomplish the object in view.]

Auvard¹ claims to have had satisfactory results in the treatment of certain cases of subacute and chronic salpingoovaritis by the new method of *vaginal distention* by tamponing. After thorough asepsis of the vagina a Cusco speculum is introduced, into which about a tablespoonful of glycerol is poured with a little iodoform to prevent any decomposition; then with a pair of pincers a tampon as large as a walnut, made of cotton firmly pressed together, is introduced; this is passed into the posterior culdesac of the vagina. The lateral culdesacs are then tamponed in the same manner and thoroughly distended, and lastly a tampon is placed in the anterior culdesac. Thus the os uteri is entirely surrounded by tampons, each saturated with the glycerol and iodoform which have been poured into the speculum. These tampons should remain in place for two or three days, and then should be taken out by the physician in attendance. With this treatment Auvard claims that cures and considerable improvement have been obtained in cases that seemed doomed to surgical interference.

[From a study of the foregoing methods of so-called conservatism in the treatment of the uterine appendages it would seem that the whole would resolve itself into the following proposition, which can be verified by reference to the papers of the authorities quoted: Should true organic change in the organs—the tubes and ovaries—exist, nothing short of complete extirpation will accomplish a cure of the patient's condition; if, however, there exist but slighter grades of inflammation, without radical organic changes, the proper course of treatment would be the institution of more conservative methods of treatment in the hope of avoiding the so-called "mutilation" of the patients. Granted that such a proposition would stand, provided it could be definitely stated in every instance just to what extent the inflammatory changes had progressed, the deplorable truth remains that even in the hands of the most adept such positivism in diagnosis is out of the question; and while some of the conservative methods of treatment might be instituted in the hope of alleviating the condition of the patient, the dangers of the delay consequent upon such a course would probably far outweigh those attendant upon extirpation of the diseased organs. While there is, therefore, a tendency in the direction of delay in the institution of operative measures, the safer course would appear to lie in immediate operative interference whenever active inflammatory disease of the uterine appendages exists.]

Baldy² lays down the broad propositions: 1. A tube whose fimbriated extremity has been destroyed, and whose canal has consequently been sealed, is, with but rare exceptions, useless; 2. There is no way whereby can be distinguished with certainty those few cases in which the tube might again be rendered patulous; and in experimenting in this direction practice has clearly demonstrated that infinite harm may be done as against the little good; 3. It is always well to save healthy ovarian tissue for the sake of

¹ Int. Med. Mag., June, 1894.

² Annals of Gyn. and Ped., April, 1894.

the continuance of menstruation and ovulation when this can safely be accomplished; 4. Uncomplicated small hematomata and hydrops folliculi do not, as a rule, give rise to distressing symptoms; 5. It is extremely probable that in the vast majority of cases of uncomplicated ovarian diseases upon which so-called conservative surgery has been used, the relief of symptoms has arisen not from the surgery, but from the enforced rest and its attendant careful nursing; 6. Adhesions or prolapse does not necessarily require removal of the uterine appendages.

Quite different from the foregoing are those cases of pelvic disease in which the symptoms are amenorrhea or dysmenorrhea with delayed puberty, and later sterility or lack of sexual desire, the whole proceeding from an infantile condition of the reproductive organs without any organic inflammatory change. Under these circumstances Bloom¹ urges the adoption of the following plan of treatment: Under an anesthetic the cervix is dilated sufficiently to readily admit a good-sized sound, while at the same time a moderate amount of massage of the pelvic organs is accomplished, followed by rest in the dorsal decubitus for twenty-four hours. Subsequent treatments are made at intervals of five or six days, consisting of the passage of a sound, first immersed in a half-strength of tincture of iodine, followed by gentle dilatation by a light pair of dilators for a few minutes, and light massage, the patient remaining perfectly quiet for an hour or two subsequently. Under such a course of treatment there occurs a stimulation of cell-metabolism resulting in an increased growth in the organs, which is not infrequently followed by the appearance of fertility in a woman previously quite sterile.

Surgical Treatment of Pelvic Disease.—[The question of the most convenient form of operating-table is still being agitated, and new tables embracing facilities for the exaggerated Trendelenburg posture are constantly being devised. Those of Landau-Vogel² and Hunter Robb³ are probably the best that have been offered during the year.] The former is so arranged that the operator can sit between the thighs of the patient during the operation; it is also possible to throw the patient into the extreme Trendelenburg position, as shown in Figure 37. Robb's table is a modification of that devised by Dr. Kelly. It is made of quartered oak and is 80.5 cm. high. The top, which when complete measures 110 cm. by 51.5 cm., is constructed in three separate pieces, *A*, *B*, and *C*. The middle portion, *B*, measuring 15 cm., is made like an extra leaf of a table to slip in and out, so that when required the table can be at once shortened by joining *A* and *C*, so that the top consists only of these two parts. This allows the anesthetizer to administer the anesthetic during an operation on the cervix or perineum with the patient in the lithotomy position, without leaning forward in a constrained position, as he is obliged to do when the ordinary table is employed (Figs. 38 and 39). The part *C*, again, consists of two pieces which are joined together by hinges. The part that works on these

¹ Univ. Med. Mag., Nov., 1894.

² Berl. klin. Woch., April 22, 1895.

³ Bull. of Johns Hopkins Hosp., June and July, 1894.

hinges can at any time be elevated at any angle and kept in the required position by means of a wooden support 11 cm. wide and 48.5 cm. long, one end of which is attached to the table on its under surface by a double hinge,

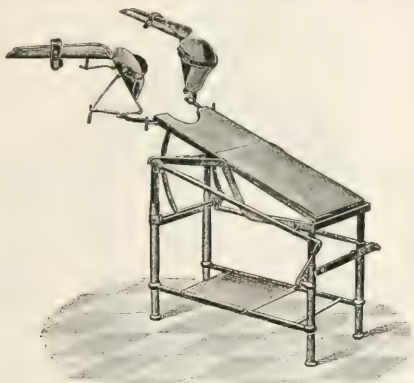


FIG. 36.—Landau-Vogel table (*Berl. klin. Woch.*, April 22, 1895).

while the other can be fitted into a series of grooves in a plank that lies a little below and parallel to the top of the table. It is thus a simple apparatus when it is desired to employ the Trendelenburg position (Fig. 40). The legs of the patient when in this position rest upon a support which is

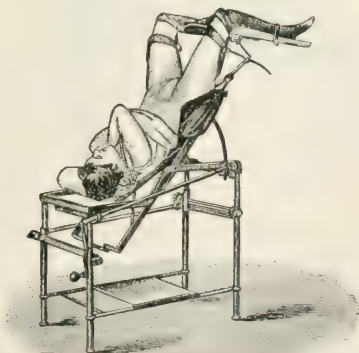


FIG. 37.—The same, showing extreme Trendelenburg position (*Berl. klin. Woch.*, April 22, 1895).

attached to the elevated portion of the table at a convenient angle. Instead of being made in one piece, the middle portion of this support, which is 30 cm. long and 30 cm. wide, is constructed to fit into grooves in the two

projecting side-pieces, so that when it is no longer required it can easily be removed. This is necessary, because if left in place it would obstruct the lowering of the table when a horizontal surface is required.

The support for the feet of the patient, when undergoing an abdominal operation, can be used as a seat for the operator when he is engaged in plastic work. In the two pieces of wood that connect the seat with the table

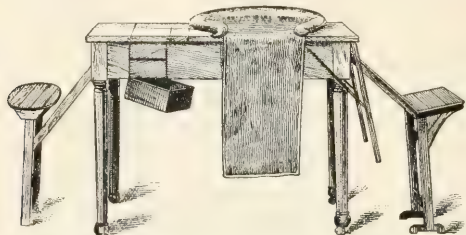


FIG. 38.—Hunter Robb's table (Bull. of J. Hopkins Hosp., June and July, 1894).

holes are drilled which are intended to receive two pegs, the tops of which are represented by two triangular pieces of wood. When in position they can be used to support a glass basin, which thus rests just in front and within easy reach of the operator, and into which can be put the scissors, knives, and any instruments which are constantly being required during a plastic operation. This seat, as well as that for the anesthetizer, can be put

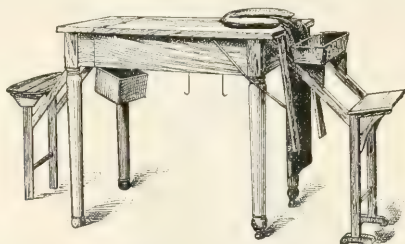


FIG. 39.—Hunter Robb's table (Bull. of J. Hopkins Hosp., June and July, 1894).

out of sight, being suspended under the table at any time when not in use. The legs of the table at one end are supplied with rubber casters, so that the position of the table can be readily changed. A wooden box is fastened on the under surface at the side of the table near the head, in which are kept the anesthetic, cones, hypodermic syringe, and other things that may be required during the operation by the anesthetizer. The advantages that the table possesses are as follows: (1) It is inexpensive; (2) it can be readily sterilized; (3) it can be shortened at a moment's notice; (4) the patient can easily be placed in the Trendelenburg position at any time, even in the

middle of the operation, without being removed from the table; (5) the seats for the operator and the anesthetizer, when not required, are out of the way; (6) a convenient receptacle for some of the most necessary instruments is put

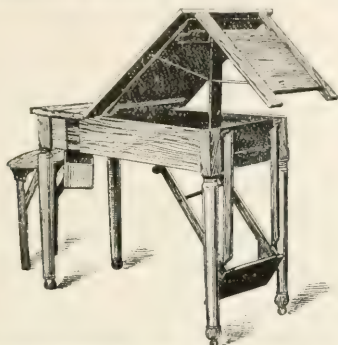


FIG. 40.—Hunter Robb's table, showing Trendelenburg posture (Bull. of J. Hopkins Hosp., June and July, 1894).

within easy reach of the operator; (7) a box is supplied to hold the ether, chloroform, and cones; (8) the table can readily be wheeled from place to place.

An important matter in the preparations for abdominal section is the securing of thoroughly *sterilized suture-material*. Kronig,¹ as shown by the experiments of Geppert, believes that the disinfection of catgut with watery and alcoholic solutions of mercuric chlorid does not kill the germs, but simply inhibits their growth. As long as the catgut retains the mercuric chlorid no organisms will grow, but if it be treated with a solution of ammonium sulphid, destroying the mercuric chlorid, organisms will soon appear. *The method of Reverdin*, the application of dry heat at a temperature of 140° C. for four hours, is positive, but the method requires too much time and apparatus. The application of dry heat at a temperature of 130° C. for one hour, as advised by *Döderlein*, does not render the catgut sterile. *The method of Brunner*, boiling it in xylol at a temperature of 136° to 140° C., is ordinarily positive, but Kronig has observed that certain spores that much resemble anthrax are not destroyed by this method, even though the boiling be continued for several hours. He advises the following method: Each strand is made into a ring four fingers' breadth in diameter and held loosely in place by three or four turns of thread, the object of this being to allow contraction of the catgut during sterilization, and also because when wound upon rollers it is usually very difficult to remove. After being thus prepared it is placed in a dry sterilizer at a temperature of 70° C. for one hour, so as to drive off the hygroscopic water, then direct into a beaker containing cumol—a hydrocarbon-compound

¹ Centralbl. f. Gynäk., No. 27, 1893.

having a boiling-point of from 168° to 178° C.—which is two-thirds buried in a sand-bath. The vessel containing the sand should be 17 cm. ($6\frac{1}{2}$ in.) in diameter and 14 cm. ($5\frac{1}{2}$ in.) deep. Heat is then applied with two Bunsen burners or a round burner, and wire gauze is placed over the beaker to prevent the cumol from igniting. When the cumol has reached a temperature of 155° C. the flame is removed, as ordinarily the temperature continues between 155° and 165° C. for an hour. A thermometer is not necessary, the boiling-point of the cumol being the guide. After thus heating for one hour the catgut is removed with sterilized forceps and placed in a previously sterilized beaker containing petroleum benzin (G. P.). In this petroleum benzin it may be kept until used, or after three hours it may be removed and placed in sterilized Patri cups. The catgut kept in Patri cups remains sterile for many weeks. Where a dry sterilizer is not at hand the catgut may be placed in a beaker or the sand-bath for two hours, the temperature in the beaker being between 70° and 100° C. A temperature of more than 100° C. dry heat destroys the catgut. Catgut previously infected with spore-forming bacilli and sterilized after this method was found to be sterile. The infecting spore-forming bacilli were shown to be particularly resistant in that, after being subjected to two hours' steam, sterilization gave many colonies on agar-agar plates. Cumol, as prepared by Dr. Grüber of Leipzig, is a fatty, light-yellow, non-explosive liquid.

The presence of *renal insufficiency* is an important modifying factor in the performance of an abdominal section. Kelly¹ regards the kidneys as more important than any other organ outside the pelvis for two reasons: If they are much diseased, the patient would not be likely to survive an operation of importance; By gaining information of the diseased condition of the kidneys the operator can stimulate other emunctories and hasten his work as much as possible.

The practical advantages to be derived from urinalysis are: 1. That operation may be refused where there is advanced renal disease. 2. By detecting the disease when of moderate severity properly directed treatment may improve the condition sufficiently to allow of operation. 3. The surgeon may be led to operate earlier in certain conditions which if allowed to go on would lead to grave kidney-complications. 4. Chloroform would be preferable to ether, although Kelly has not seen any ill effects from ether in these cases. 5. Drainage would probably be employed as an extra emunctory.

The presence of albumin without casts is not significant, nor is the presence of a few hyaline and granular casts of much importance in the absence of vascular changes and other symptoms indicative of renal disease. Transient glycosuria is not important, but diabetes mellitus contraindicates abdominal operations. The quantity of urine secreted daily is considerably diminished during the first two to four days after operation, in some cases amounting to only one-third the normal amount.

Frederick² claims that it is wrong to deny a patient operation because she

¹ Univ. Med. Mag., Aug., 1894.

² Annals of Gyn. and Ped., Oct., 1894.

simply has albuminuria, and that to say that the albuminuria that she has may not be of significance without further investigation is also wrong. The mere presence of albumin and hyaline casts in the urine, unless there be deficient excretion, portends no evil. If the quantity of urine is above twenty ounces a day, of specific gravity from 1015 to 1018, and the quantity of urea not more than 25 per cent. below normal, even if there be albumin and hyalin or a few granular casts, Frederick does not consider that a contraindication to a necessary operation exists. [In this we, with many others, believe him to be correct.]

In case *anesthesia* should be contraindicated, as by marked renal insufficiency or advanced cardiac disease, Laveau¹ has employed local anesthesia by a spray of chloric ether, while Lison of Paris recommends a new local anesthetic discovered by Joubert of Paris and termed "coryl." Chemically, this latter differs from other local anesthetics in that it is an admixture of ethyl and methyl chlorid. It is very efficient, and less dangerous than medicinal anesthetics, such as cocain, and when applied to the skin or mucous membrane reduces the temperature to about the freezing-point, or complete anesthesia, but does not cause the formation of eschars.

Among the recent suggestions in the performance of abdominal section is that of Flatau² of the *extramedian incision through the muscle* instead of in the median line. He cuts through the skin about half an inch to the left of the linea alba, and separates the muscular fibers mainly by blunt dissection. He claims by this procedure complete freedom from ventral hernia. [Until the method has been tried by a number of operators in a large number of cases, and a sufficiently long time has elapsed, there can be no particular reason to expect better results from this than from the old method.]

Dührssen³ has performed abdominal section on twenty-four patients by a new method that he terms *vaginal celiotomy*. The cervix is drawn down by forceps to near the vaginal introitus, when the vaginal fornix is opened by a cross-incision and the bladder is dissected up from the cervix so that the anterior uterine wall is exposed as far as the internal os. The vesicouterine fold is then ligated and cut. The ovaries and tubes can now be seen through the vulvar orifice, and may be removed without any difficulty. Dührssen suggests that this operation may be employed in the performance of ventral fixation for the cure of retroflexion. [The method is a particularly difficult and uncertain one, and is not to be recommended for general use.]

Dohrn⁴ has employed the *elastic ligature* in about three hundred abdominal sections, including ovariectomies and myotomies, with either intraperitoneal or extraperitoneal pedicles. The ligature is a solid, smooth strand 4 mm. thick, which is passed through a lead ring, and the ends, being drawn tightly, are held in place by clamping the ring by means of forceps. Dohrn claims that no bad results have followed its use, the ligature being readily encapsulated.

¹ N. Am. Pract., June, 1894.

² Berliner klin. Woch., No. 29, 1894.

³ Centralbl. f. Gynäk., No. 12, 1894.

⁴ Centralbl. f. Gynäk., July, 1894.

After-treatment of Abdominal Section and its Complications.—

[*Drainage after abdominal section* is deservedly becoming unpopular, even with those who have been heretofore its most earnest advocates.] Frank¹ insists that subsequent observations have confirmed the opinion which he expressed in 1881, that drainage after section is dangerous unless the diseased portion of the abdominal cavity can be completely shut off from the healthy part. It is easy thus to isolate the pelvic cavity by utilizing the existing natural barriers, the rectum with the mesorectum and mesocolon, which can be drawn down over the raw surface. This barrier is fortified by the union of the appendices epiploicæ of the gut with the parietal peritoneum. In this way the coils of small intestine are prevented from coming in contact with the raw surfaces. General adhesions will, however, render the drawing down of this protecting barrier impossible. Penrose² states that the use of the drainage-tube depends too often upon the caprice of the operator instead of upon sound scientific principles. He has been in the habit at the University Hospital of having a bacteriologic examination made of the contents of every tubal and ovarian tumor which was ruptured during removal, and the report of the pathologist regarding the septic or aseptic character of the contents has determined his decision in regard to the use of the drainage-tube. The results of this plan have been most satisfactory, for out of a series of forty-six sections, in which drainage was used but three or four times for hemorrhage and only once because the microscope showed the material which escaped to be septic, there has been no case of peritonitis or sepsis. The presence of gonococci in small numbers does not necessitate drainage. Cover-glass preparations of the material to be examined are made and fixed in the flame of an alcohol lamp and stained with carbol-fuchsin. The microscopic examination is made with a Leitz one-twelfth immersion-lens. Hartmann and Morax³ report the examination of thirty-three cases of *suppuration of the adnexa* with the following results: The pus was sterile thirteen times; it contained gonococci thirteen times, twelve times in their pure state and once in association with bacterium coli. Four times the pus contained streptococci, twice pneumococci, and once a collection of the bacterium coli. Schimmelbusch⁴ has investigated the *pathologic significance of green pus* and of the bacillus pyocyaneus, the germ producing it. By its growth in the secretion of a wound it causes a green coloring-matter—pyocyanin—and a characteristic sweetish, musty odor, which may be slightly or most offensive. This bacillus produces not only green and blue coloring-matter, but also, as may be seen in a single wound, yellow, and brown. The richest shade or shades of these four colors may be seen. The amount of irritation produced in a wound depends upon the amount of air present—that is, oxygen—whether there is a favorable culture-medium for the bacillus, and the conditions or quality of the bacillus itself. Infection of the wound does not occur through the atmosphere or dressing, or by the hands and

¹ Centralbl. f. Gynäk., No. 16, 1894.

³ Annal. de Gyn., July, 1894.

² Am. Lancet, Aug., 1894.

⁴ Centralbl. f. Gynäk., No. 8, 1894.

instruments of the physician, but the bacillus is normally found on the skin as a saprophyte. It has a predilection for particular parts of the body, as the axilla, inguinal region, anus, etc., and therefore most frequently infects wounds near these parts. From experimentation upon animals, and as far as observation upon man has gone, this organism is locally and generally virulent, but the virulence depends upon the character of invasion.

Surgical Shock.—Goodell¹ calls attention to the fact that a vast amount of shock observed after section may follow pinching of the ovaries in their removal. He has repeatedly seen the pulse fall when these organs were caught by forceps. He insists upon greater care in the avoidance of this complication.

Hemorrhage.—The arrest of hemorrhage at the time of operation is often attended with considerable difficulty. To obviate this, Kelly² has adopted the electric light as a perfect means of artificial illumination in abdominal surgery, viewing it as an indispensable part of his armamentarium. In hospital work he uses a portable droplight consisting of a sixteen-candle-power lamp attached to a short wooden handle, and connected with the source of supply by insulated wire cords. By means of such a light, held in the hand and reflected according to will in any direction, every accessible part of the pelvis appears with vivid distinctness, and the smallest oozing vessels can be picked up and torn surfaces accurately united by delicate sutures under direct inspection. Half of the lamp may be surrounded by a reflector painted black and covered with flannel on its convex surface, in order to protect the eyes and face of the operator from light and heat. The light is to be held steadily and properly directed about six inches above the patient's body and a short distance below the operator's face. When a street-current or house-current cannot be tapped, a good light may be secured by means of a portable storage-battery. Under some conditions a headlight may be employed, the light being condensed by a reflector behind and a lens in front, the lamp being attached to a flexible steel band that fits the head.

Buckmaster³ insists that the use of the drainage-tube to indicate hemorrhage is not to be relied upon. He also states that in cases of suspected hemorrhage the pelvis should not be elevated, for in this position the blood will gravitate out of the pelvis and collect under the diaphragm, where it is impossible to remove it without eventration. The blood will in many cases set up a peritonitis, and it is this peritonitis that has been blamed for many deaths due primarily to hemorrhage. A patient may have no bleeding in the pelvis when she is in the Trendelenburg posture, because the arterial pressure is diminished, but when the pelvis is lowered bleeding of a dangerous character may occur.

Intestinal Obstruction.—This complication, which causes between 1 and 2 per cent. of the deaths following abdominal section, is probably the cause of some of the fatal cases of peritonitis and intractable vomiting after opera-

¹ Annals of Gyn. and Ped., Jan., 1894.

² Am. Jour. of Obst., Sept., 1894.

³ Annals of Gyn. and Ped., May, 1894.

tion, the true condition remaining unrecognized. According to Rohé,¹ post-operative intestinal obstruction may be roughly divided into two classes of cases: one due to mechanical causes—adhesions, peritoneal bands, volvulus, accidental fixation by sutures, and compression in exudation-masses—and another due to paralysis of peristaltic movement of the intestines following sepsis or injury to the nerve-supply of the muscular coat. The obstruction may be acute—that is, occur immediately after or within a few weeks subsequent to the operation—or it may develop gradually, and not become complete until months or years afterward. Schiffer² in a paper read before the Leipzig Obstetrical Society, on comparing the results of dry and moist asepsis in abdominal section, arrives at the conclusion that when the latter method is adopted there is less disturbance of the normal intestinal peristalsis than with the former. Thus, during the two years in which sterilization by dry heat was employed in Säger's clinic there were 5 fatal cases of intestinal obstruction following 132 sections—that is, 50 per cent. of the deaths were due to this cause. From November, 1893, to July, 1894, when moist sterilization was used, there were only 2 deaths from cardiac failure in 76 sections, there being no instance in which flatus failed to pass per anum within forty-eight hours after the operation. Schiffer believes that when the peritoneum is kept moist its epithelium is less apt to be destroyed, adhesions are rare, and the normal absorptive power of the membrane is preserved, whereby culture-media for germs are removed. In addition to the classic symptoms of intestinal obstruction, recent observations have furnished other data upon which to base a diagnosis. Von Wahl's sign of local meteorism—that is, the occurrence of local distention of the bowel above the point of obstruction, and extending therefrom upward along the course of the bowel, elastic and gradually enlarging, the direction of increase in size being along the course of the constricted bowel, and associated with an increased peristaltic movement of the bowel above the point of obstruction—has been experimentally confirmed by Von Zoege-Manteuffel and Kader, and clinically by Obalinski and James Israel. Another diagnostic sign, according to Rosenbach, Rosin, and others, is furnished by the urinary reaction. It is claimed that in complete obstruction of the ileum there is always indican in the urine. In obstruction of the colon or high up in the small intestine this reaction is usually not present. The reaction is obtained by boiling a small quantity of the urine in a test-tube and adding nitric acid *guttatim*. The urine turns to a Burgundy-red color, and a similarly colored precipitate is thrown down. This has been shown by Rosin to be a mixture of the urinary coloring-matters known as indigo-blue, indigo-red, and indigo-brown. If urine yielding this reaction is shaken, a violet-colored foam is produced. Rosenbach attributes great prognostic significance to this reaction; so long as it remains the case is a grave one. If, after operation for relief of the obstruction, the reaction persists, the obstruction has not been removed. In cases in which the obstruction is relieved the reaction disappears within twenty-four hours.

¹ Canad. Pract., Oct., 1894.

² Centralbl. f. Gynäk., No. 38, 1894.

[While this sign must be regarded as a very important one, it is not absolutely pathognomonic, as a similar reaction occurs in some other morbid conditions.] In the treatment of acute intestinal obstruction Klotz has had much success from washing out the stomach with from four to six quarts of warm salt-solution. Should this fail to relieve the symptoms, he repeats it, and then passes into the stomach through the tube a large dose (one and a half to two ounces) of castor oil. In all cases so treated the active peristaltic movements set up caused a passage of flatus and feces within ten hours. [It is, however, only in cases of fresh and friable adhesions that this method can be successful. The rational treatment of the condition is to reopen the abdomen and relieve the constriction by the division of adhesions or restraining bands.] Tucker¹ insists that tapping the intestines through the abdominal walls when distended with gas is by no means a procedure devoid of danger, as seems to be generally believed.]

Urinary Suppression.—Penrose,² Kelly, and Baldy are in the habit of keeping careful measurements of the amount of urine passed during the first forty-eight and seventy-two hours after abdominal section. In 100 sections reported by the former the average amount voided for the first twenty-four hours was 13.4 ounces, for the second twenty-four hours 14.6 ounces, and for the third twenty-four hours 19.8 ounces. The cause of suppression, either partial or complete, may be ureteral injury or occlusion and renal insufficiency. Obstruction of the ureters by calculi is a very common cause of obstructive suppression. As a general rule, the urine of obstructive suppression is characterized by being passed in small quantities, of a very pale color and very low specific gravity.

Fistule.—Among the causes of fistulæ following abdominal section, according to Mundé,³ are the retention of a portion of exuded pus, *e. g.* from a ruptured pyosalpinx, the use of the drainage-tube, the irritation caused by the presence of an unabsorbed silk ligature at the bottom of the sinus, and the incomplete removal of the diseased parts, as in cases of suppurating cysts. He regards the occasional occurrence of a fistula as unavoidable. As regards treatment, if simple curetment, followed by daily irrigation of the canal with weak mercuric-chlorid solution and packing with iodoform-gauze, will not succeed, he recommends drainage through the vagina, a counter-opening being made on the point of a sound or director passed to the bottom of the sinus, and a drainage-tube being passed into the vagina. In some cases he thinks that no treatment is of any avail. [A fistula should, however, be highly exceptional, and if by accident one should occur, it is always capable of being closed if the proper methods are adopted.]

Painful Stump.—Byron Robinson⁴ says that it is not yet fully understood what produces a neuroma on the end of a ligated stump; it does not appear to be merely an infected wound, nor does it appear to occur in neurotic, debilitated patients. To prevent its occurrence he suggests that it would probably

¹ Am. Med.-Surg. Bull., June 15, 1894.

² Univ. Med. Mag., Jan., 1895.

³ N. Am. Pract., May, 1894.

⁴ Bost. Med. and Surg. Jour., Oct. 11, 1894.

be better, if possible, to isolate the arteries and ligate them alone, and to use well-sterilized suture-material. He has tried kangaroo-tendon in the abdomen, but not long enough to offer pronounced views on the subject.

Ventral Hernia.—M'Ardle¹ gives as the causes of failure of union of the abdominal incision the following in their order of importance: 1. Failure to engage the different layers of the mid-stratum sufficiently in the sutures; 2. Interposition of contused peritoneum; 3. Hematoma not becoming soundly organized; 4. Suppuration from inherent or extrinsic causes. He suggests that, in order to prevent the occurrence of the hernia, the abdomen be sutured in all sections in the same way as for hernias, that all cavities in which blood or serum could collect be obliterated, and that catch-foreeps with sharp points be used to avoid contusing the peritoneum.

Thrombosis.—Strauch² reports three cases of thrombosis of the veins of the lower extremities following sections in which the patients were placed in Trendelenburg's posture and ether employed as the anesthetic. He [unjustly, we think] attributes the complication to the posture or to the anesthetic, but his data (nineteen sections) are not sufficient wherefrom to deduce positive conclusions. Baldy has called attention to the occurrence of these cases, and has reported them as happening many times where Trendelenburg's posture had not been used.

Tachycardia.—Negri³ calls attention to a condition of tachycardia following abdominal section. He has observed two cases in which, unassociated with fever, the pulse became very much accelerated following perfectly aseptic abdominal section. The rapid pulse continued for many days, the patient in both instances slowly recovering. Negri's cases differ from those reported by Mangiagalli in that the attack was not abrupt or paroxysmal, and both patients finally recovered. He believes the condition to be wholly a nervous phenomenon.

Cutaneous Emphysema.—Madlener⁴ reports four cases of local traumatic cutaneous emphysema following abdominal section, and Graefe⁵ an additional two. Madlener inclines to the belief that this rare complication follows the retention of a large amount of air in the peritoneal cavity, and considers the prognosis of the condition as absolutely good.

Extirpation of the Uterus in Disease of the Adnexa.—A question of supreme importance, and one that has been agitating the minds of progressive abdominal surgeons of late, is the advisability of complete removal of the internal genitalia in pronounced disease of the uterine appendages. This procedure was first proposed almost simultaneously by Baldy and Polk in October, 1893. Probably the most thorough discussion of this vital point is that⁶ participated in by Baldy, Krug, Hanks, Emmet, Wylie, Pryor, and others. In opening the argument Baldy disposed of the question, *Is the uterus essential or useful after the ovaries have been removed*, in the negative. He

¹ Edin. Med. Jour., May, 1894.

² Ann. di Ost. e Gin., No. 6, 1893.

³ Ibid., Oct. 16, 1894.

⁴ Centrabl. f. Gynäk., No. 14, 1894.

⁵ Münch. med. Woch., No. 24, June 12, 1894.

⁶ Trans. of Amer. Gyn. Soc., 1894.

held that the uterus has nothing to do with those peculiarities that go to make up the womanhood of the woman, nor has it anything whatever to do with the integrity or support of the vaginal vault. His own experience has taught him that there is less sagging of the pelvic floor in those cases in which the uterus has been removed than in those in which simply a double ovariectomy has been performed. It is the common and universal experience that not all patients are cured after an operation requiring double ovariectomy, but that after a subsequent operation upon these patients, local intrauterine treatment having failed to accomplish a cure, removal of the functionless uterus has in a certain proportion of cases been followed by a permanent cure of the distressing symptoms. As to the question of an increased mortality attendant upon this more radical operation, he has found that in his hands hysterectomy not only lessened the mortality very markedly, but it has rendered the convalescence infinitely smoother, easier, and more satisfactory. On the other hand, he claimed that the retention of the uterus is not only a disadvantage to the patient, but an absolute source of danger. Not only do the symptoms often remain undiminished in their intensity, but there is very likely to follow a prolapse of the pelvic floor from the presence of the heavy organ, and the fact that about 20 per cent. of all cases of pus-tubes are of tuberculous origin renders secondary infection of the uterus imminent. Also, the elimination of any fear of future malignancy in the uterus is by no means a small consideration. Krug confirms the common experience that while removal of the appendages alone cures the patients pathologically, symptomatically few are relieved, and he believes that this continuance of the symptoms is due to the retention of the inflamed uterus, which is the primary seat and original cause of every lesion found in these cases, and to the effects of its continued influence upon the pelvic lymphatics and nerves. For the following reasons he believes that the uterus should be removed in these cases: Without the adnexa it is a useless organ, devoid of physiologic function; it is not innocuous, but is, on the contrary, positively a diseased, and therefore a harmful, organ; histologically, the tubes are but parts of the uterus, and their removal is partial amputation of the uterus; therefore, why should not a step further be taken and the rest of the diseased organ be removed? Under three conditions the others who participated in the discussion would advocate the entire extirpation of the uterus in addition to the appendages. These are: 1. When there is an old or recent pyosalpinx with much exudation, and with a purulent endometritis or a chronic catarrhal endometritis; 2. When there is a puerperal salpingitis and ovaritis, and probably a puerperal endometritis; 3. When, in removing the diseased tubes and ovaries, many adhesions are broken up, and when the uterus is retroflexed or retroverted and is held firmly down by exudate—in other words, a perimetritis in which the diseased tubes or ovaries, with a retroverted or retroflexed uterus, are all displaced and diseased, and are bound down in Douglas's pouch by plastic exudations. In this condition removal of the uterus gives the best opportunity for

draining the abraded Douglas's pouch, should it be deemed necessary to resort to drainage at all.

As opposed to the radical operation, Bache Emmet suggests the following objections: 1. After the removal of the appendages the uterus undergoes a general and rapid atrophy, whereby the development of further disease in the endometrium is rendered less probable; 2. Under properly directed treatment the existing disease of the endometrium can be largely corrected, and the symptoms complained of only follow neglect of this procedure; 3. Abdominal hysterectomy to be neatly performed requires a very much more extensive opening than is needed for simple removal of the appendages, whereby follow greater shock and increased danger of sepsis and the subsequent formation of a ventral hernia. Gill Wylie would limit the radical operation to those cases only in which there are indications of carcinomatous or other malignant disease of the uterus; when there are fibromata in the uterus; when there are indications of intractable disease of the uterus; when there are indications of septic disease in the uterus; and, as a rule, when the patient is over thirty-five years of age. Pryor would even go farther than Baldy in the radical operation, and would retain not even a portion of the cervix in bad pus-cases.

Reviewing now the additional literature upon the subject for the past twelve months, we find other eminent gynecologists taking positive positions either for or against. Penrose,¹ in a paper read before the College of Physicians of Philadelphia, states that hysterectomy is frequently indicated for conditions other than malignant disease and fibroma—that, in any case of pelvic disease in which there is necessary for cure an operation on the appendages that renders the women sterile, hysterectomy is a valuable addition to the operation under the following circumstances: When the uterus is diseased; when it is likely to become so; when its removal will facilitate the operation. He has followed this plan since June, 1893, and in a series of 75 abdominal sections on women for different forms of pelvic disease, exclusive of fibroids and malignant tumors, he has found it a distinct advantage to remove the uterus in 15 cases, grouped as follows: 1. Cases of double salpingitis, generally pyosalpinx, the disease extending into the uterine cornua in the form of a hard nodule or an abscess in the uterine tissue; large uterus; chronic metritis and endometritis; profuse irritating vaginal discharge, probably gonorrheal; 2. Cases of salpingitis and ovaritis; flexed or displaced uterus, with or without adhesions; endometritis; 3. Salpingitis, of which tuberculosis is the probable cause; 4. Cases of ruptured tubal pregnancy, of pelvic abscess, or any accumulation in the pelvis in which the uterus forms part of the wall surrounding the accumulation. The removal of the uterus facilitates the operation and perfects hemostasis. In gonorrheal cases the determination to perform hysterectomy was based on the fact that gonococci had been found in the discharge from the os uteri, or on the history of the case and the presence of gonorrheal lesions, such as inflammation of the vulvovaginal

¹ Med. News, March 17, 1894.

glands or their ducts, or urethritis, indicated the gonorrheal origin of the disease; and, finally, in other cases gonococci were sought for by an assistant in the tubal contents during the operation. He believes that in these cases the removal of the tubes relieves the danger of rupture into the peritoneum, but does not cure. The operation of removing, by a wedge-shaped amputation, the proximal end of the Fallopian tube requires the same length of time as hysterectomy, and is not followed by perfect hemostasis. Hysterectomy also cures the women of the leukorrhea—often the symptom of which they complain the most. He believes cases of leukorrhea in which pyosalpinx has coexisted are incurable. In posterior displacement, with salpingitis and adhesions to the fundus uteri, removal of the uterus gives more promise of cure than simple removal of the tubes. In tuberculous disease of the tubes, if a diagnosis is possible, hysterectomy should always be performed, as from 40 to 60 per cent. of the cases have associated tuberculous disease of the endometrium. In a case of ruptured tubal pregnancy hysterectomy was performed as a quick method of securing complete hemostasis and avoiding an elaborate drainage of the pelvis. Removal of the emasculated uterus he believes does not injure the woman, as has been shown in hysterectomy for carcinoma and fibroma, and, unlike the ovary, the uterus does not seem in any way necessary for the maintenance of womanly traits, and when removed along with the tubes and ovaries does her less harm, from a psychologic standpoint, than the common operation. When hysterectomy would increase the danger by prolonging the time of operation he considers its performance unjustifiable. But, on the contrary, if the patient's condition is such that she can endure the increased operation, he thinks hysterectomy is a valuable addition, provided the uterus is itself diseased to such an extent that it will not readily yield to local treatment, or is so implicated in a pathologic condition of the pelvis that its removal facilitates the performance of a complete operation. Statistics show that the removal of the uterus under these circumstances is attended with as small a mortality as the operation of salpingectomy. All the cases in his experience have recovered.

Skene,¹ however, takes the stand that if one has to remove the ovaries for good cause, and the uterus is involved in a disease that will subside after the removal of the ovaries and the consequent menopause, he would leave it; on the other hand, if the uterus is carcinomatous, or if there is in the uterus a soft fibroid, one that grows and gives trouble after the menopause, then he considers it justifiable to remove the uterus as well. He is unable to reason himself into the belief that an organ should be removed because it *might* some time become diseased.

[As may be noted from the preceding résumé, the weight of opinion tends largely in the direction of the more radical operation; the objections advanced by the more conservative surgeons cannot be said to be insurmountable, and, indeed, are largely disproved by the results of clinical observation. The most lamentable failures have followed the most thorough

¹ Brooklyn Med. Jour., Dec., 1894.

course of intrauterine treatment after removal of the adnexa, and the large and heavy organ removed months after the primary operation would go far to disprove the advent of a rapid atrophy after ovariectomy when there pre-exists endometrial disease. The statement that a larger abdominal incision is required for the hysterectomy has been disproved by many hysterectomists, who accomplish the easy removal of the uterus through incisions of very limited dimensions. The discussion of this subject at the session of the French Congress of Surgery in Lyons, October 9-13, 1894, likewise tended strongly in favor of the total extirpation of the internal genitalia in advanced tubal and ovarian disease.]

Hysterectomy, therefore, having been determined upon, there arises the other interesting question, Shall it be performed by the vaginal route—Péan's method—or through an abdominal incision? For America, Baldy¹ tersely sums up the question when he states that American surgeons have by the abdominal method kept the mortality somewhat lower than the French have by the vaginal method. The only possible condition in which the latter method may be preferable, he thinks, is in those cases in which there is a large pelvic abscess accompanied with dense and extensive intestinal adhesions which it would be impossible or highly dangerous to the intestines to separate. The relations existing between the cervix and the vagina need not be disturbed in the operation of hysterectomy, and yet the uterus can be removed practically in its entirety; therefore it is unnecessary to fear a weakening of the vaginal vault. Pryor quotes 85 cases performed by the abdominal method by four operators, Baldy, Krug, Pryor, and Polk, with 3 deaths, or 3.52 per cent. mortality. Abroad, however, the vaginal method is much in vogue. Jacobs² of Brussels, at the International Congress in Rome, related the results of his own experience, and quoted the statistics of others regarding vaginal hysterectomy and ovariosalpingectomy as compared with the abdominal operation. He says that since the first International Gynecologic Congress in Brussels the question regarding total castration through the vagina has progressed very much, and he believes that to-day there is ground for the argument that it will substitute the abdominal operation. He has performed vaginal castration in 184 cases, with 179 recoveries, a mortality of 2.71 per cent. This proves, he claims, that the danger in the vaginal method is not only not greater than in the abdominal, but is very much less. The combined statistics of Terrier, Terrillon, Doyen, Schauta, Chrobak, Zweifel, Martin, Jacobs, Lawson Tait, Dubois, and Gallot, with 1540 operations by the abdominal method, show a mortality of 5.7 per cent., while those of Richelot, Doyen, Péan, Segond, Rouffart, and Jacobs, with 690 operations through the vagina, show a mortality of 4.49 per cent. It also must be remembered that frequently the vaginal operation was performed only because the abdominal was impossible. Therefore, with the same class of cases the mortality in the vaginal operation would be even less than these statistics show. The objection to this method has been that when the opera-

¹ Am. Jour. of Obst., July, 1894.

² Centralbl. f. Gynäk., No. 18, 1894.

tion is once begun it must be completed, as in cases in which during the operation only one side is found diseased. Jacobs says this is not justified—that the operation should begin by opening Douglas's pouch and immediately seeking with the finger for the adnexa. If both sides are affected, a total castration should be performed, but if only one side is found diseased, a unilateral vaginal ovariosalpingectomy should be performed.

Baudron¹ enumerates as the indications for Péan's operation the following: 1. Suppurative processes of the uterine appendages (ovarian abscess, pyosalpinx); 2. Non-suppurative processes: (a) cystic salpingitis (hydrosalpinx, hematosalpinx), (b) parenchymatous salpingitis, (c) catarrhal salpingitis; 3. Pelvic neuralgia; 4. Extrauterine pregnancy; 5. Retroversion of the uterus with prolapsed and diseased appendages; 6. Surgical perforation of the uterus, as that occurring during curetment. Second² reports 22 vaginal hysterectomies during 1893 without a death; in 4 cases there were purulent foci in the pelvis, and in 6 uterine fibroids as well as double salpingitis.

Pelvic Abscess.—Fordyce³ regards uterosacral cellulitis as a definite disease of very frequent occurrence, and unaccompanied, in by far the greater number of the cases, by any pathologic condition of the tubes and ovaries, and characterized by quite constant and definite symptoms. It is the commonest cause of that degree of antelexion of the uterus that is termed pathologic, and is met with both in nulliparous and parous patients, although more frequently found in those who have borne children, and is generally puerperal in origin. It may be acute, or from the first—due, in all probability, to a septic infection from a torn cervix or perineum—it may be of a low and chronic form, the *parametritis chronica atrophicans* of Freund. The symptoms are pain, chiefly situated in the back, dragging or aching in character, and worse after exertion; pronounced and troublesome dysmenorrhea, most marked during the flow, and in inverse ratio to the amount of blood lost; gradual diminution in the duration of the menstrual flow; relative or absolute sterility; vesical troubles; dyspareunia; and pain in defecation. The treatment includes strict attention to the bowels, bodily rest, absolute sexual incontinence, hot douching night and morning, warm hip-baths, and internally a saline mixture or potassium iodid.

Under the subject of the treatment of pelvic abscess Landau⁴ takes the following stand: An unilocular abscess pointing in the vagina should be incised through the posterior fornix. It makes no difference whether the abscess thus treated is intraperitoneal or extraperitoneal, so long as it consists of a single cavity. [He fails, however, to tell us how this most essential point is to be determined.] In the case of a recurrent *multilocular* abscess, as in unilateral pyosalpinx, he says that extirpation by abdominal section is alone indicated, but if after opening the abdomen the collection of pus is

¹ Centralbl. f. Chirurg., Sept. 1, 1894.

² Am. Jour. Med. Sci., May, 1894.

³ Edinburgh Med. Jour., March, 1895.

⁴ Archiv f. Gynäk., Bd. xlv. Heft 3, 1894.

found to be extraperitoneal, it is better to evacuate the latter through the vagina. In cases of double unilocular abscesses vaginal incision and drainage should be practised, since in this way the functions of the tubes and ovaries may be preserved, while if desired a radical operation can be performed just as well subsequently. Multilocular abscesses involving both tubes, simple or complicated with extraperitoneal pus-collections, may be removed by abdominal section, but a better prospect of effecting a radical cure is offered by vaginal extirpation of the uterus with the adnexa. This is best effected by morcellation and the use of clamps. Péan and Segond's recommendation to secure drainage by the removal of the uterus alone, in complicated cases in which the pus-sacs cannot be extirpated through the vagina, does not appear rational. Under these circumstances it is better to remove as much as possible from below, and the rest of the diseased tissues through an abdominal incision. In case of doubt as to the existence of bilateral suppurative disease explorative section is first indicated. In other cases, even when it seems doubtful if the affected organs can be entirely removed through the vagina, the attempt should first be made from below, except when examination has shown that the pus-tubes are situated high up in the pelvic cavity; under the latter circumstances adhesions should be broken up and the adnexa removed by section, after which the uterus should in every case be extirpated through the vagina on account of the far greater relative safety of this procedure. Experience has shown that those cases do better in which combined drainage is used, a glass tube being left in the abdominal wound for three or four days. Leopold is accustomed to perform abdominal section in uncomplicated cases, but in cases complicated with fistulæ, when the patient has been bedridden for years, or when experience has shown that the uterus, if allowed to remain, would cause persistent trouble, he is accustomed to remove the organ with the adnexa through the vagina, using ligatures instead of forcipressure. He reports 30 cases with only 1 death.

Abdominal Section and Hysterectomy for Puerperal Sepsis.—[Within the last few months there has arisen a growing interest in that most important question in abdominal surgery—namely, What is the value of surgical interference in those cases of puerperal sepsis not amenable to the ordinary methods of treatment by curettage and uterine irrigation? The almost invariably fatal result that follows the expectant plan of treatment has led to the serious consideration of other more active measures in the hope of reducing the frightful mortality that has held hitherto.] There are three distinct forms of puerperal sepsis that demand abdominal section—namely, the peritonitic, the metritic, and the cellular.

According to Noble,¹ cases of puerperal peritonitis may be divided into two classes—those in which some pathologic condition is present in the sexual organ of the woman before labor, and those in which these organs are normal. The first class embraces those cases caused by the bruising or

¹ Am. Gyn. and Obst. Jour., April, 1895.

rupture of tumors situated in the pelvis, or of pus-sacs or other septic accumulations in the Fallopian tubes or other pelvic organs. In these patients the birth-canal and lymphatics are not involved; hence prompt operation, with the removal of the tumor, has been followed by a high percentage of cures. Peritonitis due to the bruising or rupture of pus-accumulations is not of frequent occurrence, since women so afflicted are usually sterile. Here, also, the uterus is not involved, and prompt operation, irrigation, and drainage should be followed by a cure.

The second class of cases in which the peritonitis results from infection of the birth-canal in women having normal sexual organs previous to labor is of far more importance than that just considered, and far more common. The peritonitis in these patients may arise either through the spread of the septic inflammation by way of the Fallopian tubes to the peritoneum, or by infection spreading through the lymphatics either directly through the uterus to its peritoneal covering, or by way of the lymphatics of the broad ligaments. In the former method the inflammatory element is more, and the septic element less, marked, the reverse being true in the lymphatic variety. Pus-tubes and localized intraperitoneal collections of pus result in the first variety, while in the lymphatic form there exists a general septicemia. In the first variety abdominal section, with removal of the pus-accumulations and irrigation, may, and often is, followed by a cure; lymphatic puerperal peritonitis, however, is not amenable to treatment by abdominal section. In these peritonitic cases a small median incision, two or three inches in length, and thorough irrigation with hot water at 110° – 115° F., are devoid of danger and may result in a cure. Noble has sent queries to many obstetricians at home and abroad concerning such operative methods, and in no case did any report death when nothing was removed from the abdomen, while recovery was usually rapid.

In the cellular variety, when a true extraperitoneal pelvic abscess has developed, an early suprapubic incision above Poupart's ligament over the pus-focus will generally result favorably. In such cases operations through the median incision should never be performed. Occasionally a vaginal celiotomy will drain such an abscess with the least disturbance and will give valuable time for an improvement in the general condition of the patient.

Much more serious are those cases of infection from the birth-canal in which the progress of the disease is from bad to worse, in spite of irrigation and curetment of the uterovaginal canal. The infected uterus is the nidus of the morbid process here, and the only proper treatment, according to Noble, Baldy, Hirst, and others, is hysterectomy. As to the route by which this should be done there is still much discussion. The great success that has been achieved in hysterectomy, done by way of the vagina, for nonpuerperal conditions, in the hands of the French school of surgeons, raises the question whether or not this method of operating should not be selected in puerperal cases. Noble remarks that experience alone must determine this question,

while Henrotin¹ is strongly in favor of vaginal hysterectomy for all forms of septic pelvic disease. The advantages claimed by Henrotin for this procedure are that it only disturbs the general abdominal cavity to a slight extent; it scarcely invades any but diseased territory; and it leaves a broad, straight opening for drainage. On the other hand, Baldy holds that the hysterectomy by the abdominal method is the better, as the diagnosis can be thus accurately determined and the operation stopped in time if found necessary; the danger is no greater than by the vaginal method, while the operation is a more complete one. E. P. Davis² says that if vaginal hysterectomy with removal of the tubes and ovaries can be performed, it may in the cellular form of sepsis supplement the vaginal drainage of an abscess. If it cannot be performed, suprapubic section, with amputation or extirpation of the uterus and appendages and vaginal drainage, is indicated.

[The preferable method, however, and that which is coming into general favor, is abdominal hysterectomy.] Noble³ says that he is prepared to advocate the performance of hysterectomy for infection of the uterus when, in spite of thorough curetment, followed by copious irrigation of the utero-vaginal canal and the use of an iodoform-suppository and gauze within the uterus, the septic symptoms increase in severity. To give any reasonable chances of success from the operation, however, it should be done within the first few days of infection, and rarely, if ever, later than the first week after labor. In reply to those operators who object to interfering at all in these cases, Baldy very aptly remarks: "If we have pus in the tubes and the patient is dying with sepsis, we would remove the offending organs. Then why not remove the uterus when the pus is in the uterine wall?" The difficulty lies, as suggested by Polk, in drawing clinically the sharp pathologic distinction between the various kinds of puerperal infection that are offered for treatment. The only rational procedure, however, is to act promptly, not waiting for fatal symptoms to appear, but anticipating the evil, for these cases all represent septic poisoning, whether the case be a simple superficial endometritis or the beginning of the extreme form of lymphangitis. Pryor believes that when it is impossible to check puerperal sepsis by irrigation, cureting, and antiseptic dressings, the case is beyond immediate surgical relief, but should he do a section he would most certainly ablate the whole organ; simple removal of the tubes and ovaries he would deem worse than useless. By removal of the uterus the absorption of sepsis is at once stopped, and unless sufficient has already been absorbed to too greatly disorganize the blood, the patient will easily survive.

DISEASES OF THE OVARIES.

Physiology of the Ovary.—An interesting question is involved in the query propounded by Routh⁴—namely, Have we any evidence that spermin taken from a woman has, when used in like manner to that taken from a

¹ Am. Jour. of Obst., April, 1895.

² Loc. cit.

³ Ibid., Feb., 1895.

⁴ Prov. Med. Jour., June 1, 1894.

man and injected subcutaneously, a similar effect? Goizet in his book¹ makes the following observation: "My personal experience on the juice extracted from the ovaries of animals demonstrates that this juice has *no* effect either on male or female. The female does not possess in her the power at the disposal of the male; no part of a female being contains a fluid similar to the testicular juice. It belongs exclusively to the male, although it is secreted under female influence." Routh remarks that it is difficult to reconcile this opinion with the results obtained by Dr. M. Augusta Brown of the Faculty of Paris. Mrs. Brown undertook the study of subcutaneous injection of ovarian juice taken from animals. She performed her experiments upon a large number of women, and her results were extremely interesting. She selected the ovaries of rabbits, removed from the abdomens of living animals, following the same rules given for the testicles, sometimes using the Pasteur filter by paper. The injections were made subcutaneously on the thorax or abdomen, both instruments and vessels being antiseptically prepared. She treated in this manner more than a dozen women affected with extreme debility, caused by age, insomnia, hysteria, and uterine affections. In all she found great gain of strength, in others restoration of sleep, stoppage of the hysteric attacks and cardiac palpitations, and an amelioration both of digestion and nutrition. In one remarkable case of an old woman who had possessed a splendid voice, but had lost it, the ovarian juice subcutaneously injected caused it to return with former power. Mrs. Brown found, however, that six or seven injections were often required. An effort was made to have the juice absorbed over a portion of skin previously blistered, but the results obtained were much less favorable. The conclusion reached was that the effect of injection of ovarian juice subcutaneously was identical with injection of testicular juice, but less powerful, and Routh remarks that such a conclusion is in keeping with the presence of spermin in the ovary. This is somewhat in accord with Martin, who, in his paper on the nerve-theory of menstruation, remarks: "It is probable that the ovaries, like the liver and thyroid gland, modify the blood circulating through them and add to the blood some peculiar product of their metabolism. It may be that some of the climacteric symptoms are due to the loss of this substance from the system." Buys and Vandervelde² have published the results of a series of experiments made in order to throw light on the effects of castration on uterine tissue. They removed the ovaries of a rabbit, and at the same time amputated one uterine cornu. The animal was killed, in the first experiment ten days, and in the fifth and last sixty-seven days, after the operation. The remaining cornu was then examined in each case and compared with the amputated cornu. The appearances are carefully tabulated. No change could be detected in the endothelium of the serous coat nor in the subserous connective tissue. The muscular coat had undergone simple atrophy, most marked in the outer or longitudinal fibers. The muscle-cells showed none

¹ *La Vie prolongée par la Méthode Brown-Séguard*, p. 91.

² *Archives Italiennes de Biologie*, vol. xxi., pt. 1, May, 1894.

of the changes seen in involution after pregnancy. The endometrium was much changed. The deeper tissue had lost all its well-known cellular elements, and was reduced to a cicatricial mass; the cylindric epithelium of the uterine mucous glands at first undergoes degeneration and finally necroses. The walls of the arterioles become much thickened. [These changes correspond precisely with those observed by Steinhaus¹ in the endometrium of women at the menopause.] Buys and Vandervelde attribute this degeneration to trophic changes caused by removal of the ovaries.

Oophoritis.—Although generally complicated, oophoritis is, according to Sanders,² rarely dangerous to life; the large majority of its complications reside in the uterus itself, and only exceptionally, or at least in a small percentage of cases, are the tubes diseased. In only about 8 per cent. of all cases of oophoritis is pyosalpinx discovered, and fully 90 per cent. of all instances of chronic oophoritis carry absolutely no danger to life with them, but simply entail suffering and chronic invalidism. Working upon such a [fallacious] basis as this, Sanders proceeds to denounce surgical procedures for the relief of the condition as exposing the patients to unwarrantable risks during and after the operation. He says that, "taking Dr. Lee's results as the standard, we have 58 per cent. of cures, 27 per cent. of relief, and 15 per cent. of absolute failures among those surviving the operation." [Such results are absolutely incorrect when the statistics of the masters in gynecologic surgery are consulted.] On the contrary, Sanders claims that electricity will succeed in fully 90 per cent. of all cases so treated, thus placing himself in the front of the most enthusiastic advocates of this [rather questionable] treatment. Wintcenilz's³ treatment of oophoritis is the following: Rest in bed; vaginal injections of hot salt water; scarification of the os uteri twice daily; rubbing of the abdomen with an ointment composed of ichthyol and lanolin in equal parts; and a teaspoonful at bedtime of the following mixture for constipation: *R.* Sodium sulphate, ʒiv ; sulphur, ʒj ; sugar, ʒv ; essence of peppermint, *q. s.* [In principle this is exactly Goodell's teaching of years ago.]

Ovarian Cysts.—In discussing the morphology of ovarian cysts Kelly remarks that the form of abdomen characteristic of large ovarian cysts is a globular or ovoid distention of a part or the whole of the abdominal wall, pushing out the infraumbilical portion much more than the supraumbilical, at least so long as the tumor occupies the lower half or two-thirds of the abdomen. This enlargement is uniform in parovarian cysts and polycystic tumors exhibiting but few bosses. Polycystic ovarian tumors left to grow until they extend above the umbilicus, if not held by adhesions, are most likely to be markedly displaced to the right side. This displacement, he says, is produced by the stomach, for the repeated soft impacts of the constantly alternately enlarging and contracting stomach are far more potent

¹ Menstruation and Ovulation, 1890.

² Med. News, Oct. 20, 1894.

³ New York Med. Rec., July 14, 1894.

than the tendency of gravity to keep it forward in the median line, or the tendency of the movements of the patient to dispose of it in some other position.

Francis Foerster¹ has made an extensive comparative microscopic study of diseased ovaries, and as a result of his investigations has reached the following conclusions: Small cysts are originally Graafian follicles, and are of common occurrence, not only in human ovaries, but also in those of the sow, ewe, and cow. In a process not exactly pathologic the stratified epithelial lining of the Graafian follicle undergoes peculiar changes leading to its disappearance. The epithelium first breaks up into an indifferent or medullary tissue, and from this arises myxomatous vascularized connective tissue. The type of this newly formed myxomatous tissue varies in different animals. It may be medullary-myxomatous or myxomatous lymph-tissue, or fully-developed myxomatous tissue with a well-marked basis-substance; it is always scantily supplied with blood-vessels, which probably grow into it from without. The myxomatous lining of the cyst-wall is always well defined toward the outer fibrous coat, the original capsule of the Graafian follicle. The ovule is present at the beginning of the formation of a small cyst, but later it probably perishes, owing to the changed environments. Madlener² remarks that in recent literature an indistinct form of tuberculosis of the ovary has frequently been mentioned, demonstrated by minute areas of caseation, and also, but very rarely, tuberculous ovarian cysts have been described. Of the latter there are two distinct forms: 1. Those in which the cyst is a primary, uncomplicated, proliferating ovarian cyst, the peritoneum and wall of which are infiltrated with secondary miliary tubercles. Of this form three cases have been reported (Spencer Wells, Baumgarten, and Sänger); 2. Those in which the external surface is smooth and does not differ from the ordinary ovarian cyst, but the contents of which are composed of pus and caseous material. The inner surface of the cyst-wall is lined with tubercles and caseous masses. The cyst appears as a large tubercle in the ovarian substance, the center of which has undergone caseation and liquefaction; therefore it increases in size through tubercular destruction of its walls. Madlener reports a case of tuberculous ovarian cyst associated with an adenomatous intrauterine polyp situated at the fundus of the uterus, which microscopically was shown to be infiltrated with miliary tubercles containing giant-cells and tubercle-bacilli. Only one other instance of tuberculous intrauterine polyp has been reported.

Routh,³ from a study of some cases of associated parovarian and vaginal cysts formed from a distended Gärtner duct, offers the following propositions: 1. That Gärtner's duct can be traced in some cases in the adult female from the parovarium to the vestibuli vulvæ, ending just beneath and slightly to one side of the urethral orifice; 2. Homology tends to show that Max Schüller's glands are diverticula of Gärtner's ducts, just as the vesiculæ

¹ Am. Jour. of Obst., Feb., 1894.

² Centralbl. f. Gynäk., No. 22, 1894.

³ Trans. of Obst. Soc. of London, vol. xxxvi., 1894.

seminales are diverticula of the vasa deferentia. Some evidence is given that Skene's ducts are not necessarily identical with the anterior termination of Gärtner's ducts (as most of those who have traced Gärtner's duct to the vestibule have thought), but that Skene's ducts lead directly and solely from Max Schüller's urethral glands, Gärtner's ducts being continued to the vestibule behind, but parallel to, Skene's ducts; 3. That Gärtner's duct, if patent, may become distended at any part of its course, constituting a variety of parovarian cyst if the distention is in the broad-ligament portion, and a vaginal cyst if the distention is in the vaginal portion; 4. These cases may afford an explanation of some obscure cases of profuse watery discharge from the vagina, not coming from the uterus or bladder; 5. In cases in which the whole duct is distended the vaginal portion of the cyst may be laid open as far as the base of the broad ligament, and the broad-ligament portion encouraged to contract and close up.

In regard to the causes of the pedicle-torsion of ovarian cysts, Simpson¹ accepts the law as expounded by Freund. Freund has shown that in the progress of growth ovarian tumors undergo changes of position at two different stages. In the first, whilst they are pelvic, their tendency is to grow downward behind the uterus and to keep their pedicle on their anterior aspect. In the second stage, when they rise out of the pelvis, they tend to fall forward toward the abdominal wall, and their pedicle is then found on their posterior aspect. Prof. Goodsir used to teach that there was a law of spirality guiding the growth of all organisms. This idea has been elaborated by Prof. Emil Fischer of Strassburg, who maintains that axial torsion is a function of the living cell; that the growth of organisms takes place under constant spiral axial torsion, and that bilateral symmetric organisms possess on the right side of the body sinistrospral growth-torsions, and on the left dextrospral growth-torsions; and he indicates that this holds good with regard to ovaries, ovarian ligaments, tubes, and broad ligaments. H. Freund has made observations that confirm Fischer's thesis, and, pushing his investigations into the condition of the pedicle of ovarian tumors, he comes to the conclusion that in all cases in which an ovarian tumor reaches the second stage, and has no obstacle presented to its usual progress, there will be found a torsion of the pedicle to the left in right-sided, and to the right in left-sided, tumors. The usual rotation may be prevented or counteracted by adhesions, by the presence of other tumors, or by undue tension of the abdominal walls. The rotation may represent only half a turn or a full turn, and in some cases may be oftener twisted without giving rise to distinct disturbance, though he finds that the cases of exaggerated torsion occur, in the nearly two hundred cases that formed the subject of his research, in about the proportion of 8 per cent., which is given by Olshausen as the percentage of pedicle-torsions generally in ovariectomy. Whatever may lead in individual cases to the exaggerated torsions, Freund seems to have fairly established the law that right ovarian and parovarian tumors have normally a sinistro-

¹ Edin. Med. Jour., Aug., 1894.

spiral twist of the pedicle, and that tumors of the left side have a dextro-spiral twist.

In regard to the origin of dermoid cysts, Simpson¹ gives as the two most satisfactory theories—first, that they arise from perverted development of an ovum or a primordial germ-cell; secondly, that they are due to the inclusion of the cutaneous elements that have become ensnared among the deeper tissues during the development of the embryo.

Malignant Disease of the Ovary.—Von Adelung² gives the following method of differential diagnosis between alveolar sarcoma of the ovary, which he considers a much more common condition than is generally supposed, and carcinoma: Very thin sections are cut and shaken with water in a test-tube; these, examined under the microscope, will show a loss of the cells from the alveoli in carcinoma, but not so in sarcoma. Gage³ remarks that, contrary to the general rule, it would seem as if malignancy of the ovary were relatively more common in tumors appearing in early life. Of 77 cases of carcinoma collected by Leopold, 27 occurred between the ages of eight and thirty, most of them about twenty years, and in 37 cases of ovarian sarcoma collected by Olshausen 14 were in patients under thirty years old. It has been suggested, therefore, that malignant disease is to be looked for often about the age of puberty, and again at the beginning of senile atrophy.

Ovarian Abscess.—Von Rosthorn⁴ reports a case in which he found the pneumococcus in the pus of an ovarian abscess, and writes that he has been able to find only two cases reported in the German literature (Sweifel and Frommel), and one case in the French literature (Morax), in which this organism was found in the pus of a pyosalpinx. The first case (Sweifel) was in a girl eighteen years of age, who had had neither pneumonia nor tuberculosis. She recovered after operation. The second case (Frommel) occurred in a woman thirty-eight years of age, who was suffering with phthisis pulmonalis. The pyosalpinx appeared after a puerperium associated with fever. The patient died with sepsis, and at the postmortem examination, made sixty hours after death, Fränkel himself procured an almost pure culture of the organism. Inoculations from this culture into animals proved rapidly fatal. This case proved that the pneumococcus is excessively virulent. The history of Von Rosthorn's case is as follows: A servant-girl, twenty-eight years of age, had complained of pain in the lower abdomen since a puerperium associated with fever six years before. On making a vaginal examination a very painful and immovable tumor, the size of an orange, was felt in the right ovarian region. After many weeks of conservative treatment and rest without the least benefit, the tumor was removed by abdominal incision. At the operation the growth was found so universally covered with adhesions that its anatomic parts could not be recognized. The complete separation of the

¹ Loc. cit.

² Pacific Med. Jour., Aug., 1894.

³ Jour. Am. Med. Assoc., Dec. 8, 1894.

⁴ Prager medicinische Wochenschrift, No. 2, 1894.

growth from the lateral wall of the uterus and pelvis was impossible, and it was therefore amputated with the thermocautery. The site of the growth was packed with iodoform-gauze, and the stump sutured to the abdominal wall. The tumor was the shape of an egg, 12 cm. in length, and on section was found to be an abscess containing a thick greenish pus. The walls were composed of very dense tissue, and its internal surface was covered with a membrane which at first sight appeared like a mucosa, but was truly an abscess-membrane. Microscopic sections showed the abscess-wall to contain the tube-wall and ovarian-tissue masses of caseation. An inoculation taken from the pus gave a pure culture of the pneumococcus. The patient recovered.

PEDIATRICS.¹

By LOUIS STARR, M. D., AND THOMPSON S. WESTCOTT, M. D.,
OF PHILADELPHIA.

PHYSIOLOGY.

Infant Measurement.—Chapin² has suggested a convenient system for infant measurement which can be carried out with no more elaborate apparatus than a tape-measure, a strip of sheet lead, a pencil, a pair of calipers, and a table. The rapid evolution of the brain during infancy, and the fact that the future efficiency and well-being of the individual depend so largely upon its normal and healthy growth, render a study of the head of great interest, and accordingly ten of the measurements are made upon the skull, the circumferences of the chest and abdomen and length and weight of body completing the series. Data can thus be gathered from a large number of observations to furnish a standard average of brain-growth and development for purposes of comparison with measurements in any given case. Ninety-eight cases from birth up to two years have been thus measured, and, while the number is yet small, the table of results shows that the possibilities of the system are noteworthy.

The Center for Sucking.—Basch³ has made some experiments to determine the central innervation of the act of sucking in infants. From these he concludes that the centers presiding over this action embrace two symmetrical regions of the medulla, lying to the inner side of the restiform body, and including the centers of the trigeminus, the facialis, and the hypoglossus, which together form the reflex arc concerned in the act. The special center is probably located in the substance between the sensory and motor origins of the trigeminus. In his experiments one-sided paralysis of the hypoglossus interfered most with the act, while section of the muscles of mastication (masseter and digastric) affected it less, and palsy of the facial produced the least disturbance. Combination of facial and hypoglossal palsy seemed only slightly to aggravate the effect of a simple hypoglossal palsy.

¹ During the year activity in all branches of pediatric work has given way to the demands of experimental investigation of the claims of the new remedy against diphtheria—antitoxin. The literature upon this subject has been enormous, and all other subjects have been more or less neglected. It is the topic of the hour, and has demanded at our hands space commensurate with its importance.

² Med. Record, Nov. 24, 1894.

³ Jahrb. f. Kinderheilk., Bd. xxxviii. S. 68.

The sensory fibers of the trigeminus form the sensory portion of the reflex arc.

Hemihypertrophy.—S. S. Adams¹ of Washington reports an unusual case of hemihypertrophy in a boy of ten years. There was nothing noteworthy in the family history, and he had suffered from none of the diseases of childhood. Deformity was noticeable at birth, but not to such a degree relatively as at a later period. The increased growth affected the entire right half of the body, including the face, but was most noticeable in the leg, thigh, and buttock. Numerous telangiectatic spots were scattered irregularly over the body, but most thickly on the right side, especially on the outer surface of the leg. A very similar case is recorded by J. Black Milne² in a female child of twelve months. The only deviation from a uniform excess in size of the right side was shown in the forefinger and thumb, which were of the same size as on the other hand; and the left side showed no overgrowth in any of its members, except a little enlargement of the second toe. While hypertrophy of one side is the usual description of such cases, the author suggests that there may be a condition of defect upon the other side, and is inclined to think that in his case the limb, hand, and foot of the left side seemed rather below the average of the child's age. In this case, as in others previously reported, there were numerous dark-red or reddish-purple blotches of congestion scattered irregularly over the body.

INFANT FEEDING.

Physiology of Milk-secretion.—Johannessen³ has made a study of the physiology of milk-secretion, drawing his data from 25 nursing women coming under observation in the University-polyclinic of Christiania. His average analysis of human milk differs considerably from that of most observers, of which the figures of König and of Leeds may be taken as a fair representation:

	Johannessen.	König.	Leeds.
Fats,	3.21 per cent.	3.78 per cent.	4.13 per cent.
Lactose,	4.67 “	6.21 “	7.00 “
Albuminoids,	1.104 “	2.29 “	2.00 “

These results differ so markedly from those long accepted that the influence of climate, race, or other condition belonging to this particular series of observations must be invoked to explain it. Comparative studies of the secretion of the right and left glands showed that the milk from the left breast was slightly poorer in albuminoids and fats, but richer in sugar, than that from the right breast. After nursing, albuminoids and sugar were found slightly decreased, but fat was increased about 40 per cent.—results that do not show the great difference before and after nursing that Mendez de Leon and Pfeiffer have found. Johannessen confirms the statement of Vernois and

¹ Archives of Pediatrics, Dec., 1894.

² Quarterly Med. Jour., April, 1895.

³ Jahrb. f. Kinderheilk., Bd. xxxix. S. 380.

PEDIATRICS.

PLATE XII.



Bequerel that blondes give milk richer in fat and sugar, but poorer in albuminoids, than brunettes.

Recent analyses of the mineral constituents of human milk, made under Rotch's¹ direction, give results somewhat different from those already accepted. In the first place, the phosphoric acid is less than half as much as previously reported; the magnesia is also less than half as much; and silica and alumina are present, though not returned in any previous analysis. These results being obtained from specimens from a large number of women, it may be presumed that with the accurate chemical methods of the present day this analysis represents a fairer average of the mineral constituents of mother's milk than has been previously obtained.

Bactericidal Effect of the Filtration of Milk.—Seibert² has found that simple filtration of milk through a half-inch layer of compressed absorbent cotton is an efficient means of removing a very large proportion of the contained bacteria; at the same time, the amount of cream is not altered, the amount of fat remains the same, and the specific gravity of the milk is not changed, unless so much filth remained in the cotton as to explain the difference—an occurrence found but twice in thirty tests. Culture-experiments made with raw and sterilized milk, before and after filtering, showed that in the former case an actual count of germ-colonies gave in ten instances 3800 to 200,000 germs to the cubic centimeter unfiltered, and from one-half to one-fourth of that quantity after filtering. The larger numbers were seen in April, the smaller in March. In sterilized milk (forty minutes), after four days' culture, unfiltered specimens showed 56,000 colonies on the average, while the filtered ones held but from 300 to 800 durable germs to the cubic centimeter. Dr. Seibert's experiments were controlled and confirmed by Dr. Kiliani. These results offer a fertile field for further inquiry.

Modifications of Milk for Infant Feeding.—Gärtner³ proposes for infant feeding freshly separated diluted cow's cream. Good milk is diluted with an equal quantity of water and placed in a centrifugal separator. The fluid from the "cream-tap" contains all the cream of the original milk except about .1 or .2 per cent., half the proteids, and half the milk-sugar; and, with the exception of the sugar, forms a very close imitation of the proportions of human milk. The deficiency in milk-sugar may be readily supplied in the usual way. Another advantage urged by Gärtner for this so-called "fat-milk" is that the grosser impurities of the milk are removed by the centrifugalization.

Satisfactory results are claimed by Oppenheim⁴ from a food prepared in the following way: Mix a teaspoonful of flour and half a cup of cold water; to this add twelve ounces of boiling water and boil for ten minutes in a double boiler; remove the inner vessel and add to the mixture another twelve

¹ Medical and Surgical Reporter, Feb. 16, 1895.

² Arch. of Ped., July, 1894.

³ Allgemeines. Wien. med. Zeitung, Oct. 13, 1894.

⁴ New York Medical Journal, July 21, 1894.

ounces of cold water and half a teaspoonful of maltine; allow it to stand for fifteen minutes in order to let the diastase act upon the starch; then replace the vessel in the boiling water and boil again for fifteen minutes. This mixture, after being strained, should be added to an equal quantity of fresh milk, though the proportion of each may be varied for individual cases. Ninety cases were put upon this mixture, 77 of which were babies between the ages of three weeks and fourteen months. All of them were suffering with disorders characteristic of malnutrition and malassimilation. Of these 77, 63 improved at once and continued to thrive. Thirteen required additional treatment; 1 showed no improvement under this diet; the remaining 13 cases varied from fourteen to twenty-six months of age, and all of them within varying spaces of time took kindly to the food and thrived on it.

Sterilization of Milk.—The ultimate place to be accorded sterilization as a means of preserving cow's milk for infant feeding is still a matter of uncertainty. Since the report of the studies of Leeds and Davis in 1891 there has been a growing tendency to regard sterilization as a not unmixed blessing, and to advocate, in preference, the so-called process of "pasteurization." It is generally conceded that heating to a temperature of 75° C. destroys all the pathogenic bacteria usually found in milk, but, as Koplik has shown, this does not kill the *bacterium lactis*, the *potato-bacillus*, and other microorganisms. In other words, while pasteurization is efficient in removing the possible dangers of accidental infection, it does not to any great extent retard the development of the bacteria that bring about rapid changes in the milk and unfit it for food. This aspect of the question is partially covered in a recent paper by Emily Lewi,¹ who has made an interesting investigation of the milk-supply of New York City. The conclusions of this study justify the statement that both in winter and summer the ordinary commercial milk upon its arrival in the city is within the incubation-period, this stage lasting twenty-four hours in winter, thirteen to seventeen hours on a fairly cool day, and five hours on a hot summer day, after reaching the city. This milk is therefore considered fit for infant feeding, if prepared early in the day. Further experiments to test the value of pasteurization as a preservative process were made with the Freeman apparatus. On a warm summer day pasteurized milk had a fairly stationary acidity for from ten to twelve hours, the acidity then rising slowly until at the end of twenty-four hours the milk was curdled. The growth of the *bacterium lactis* was thus retarded about six hours as compared with unpasteurized milk. On the other hand, sterilization at from 90° to 92° C. for forty minutes, while making the milk far from absolutely sterile, rendered the *bacterium lactis* inert for two days at least, at a summer temperature. It may therefore be concluded that without subsequent refrigeration pasteurization in summer does not offer a safe means of preparing milk for infant feeding; and this agrees with the earlier observations of Bitter and the view of

¹ New York Medical Journal, Feb. 9, 1895.

Flügge,¹ recently expressed, that milk pasteurized at the dairy must, upon reaching the city, be treated as unpasteurized milk, so far as its adaptation for an infant food is concerned.

The work of Leeds and Davis has not, however, been accepted by all observers as conclusive. Heubner has shown by actual statistics that a large percentage of cases of chronic intestinal disorders of a variety incurable before the introduction of sterilized milk are improved and cured by such a preparation, though he admits that a certain percentage of cases of chronic intestinal catarrh with atrophy are not benefited by it. Koplik,² writing most recently, maintains that in such cases it is not a question of the degree of heat used. He emphasizes the suggestion of Hammarsten (1877), as borne out by the more recent experiments of Wroblewski,³ that the casein of mother's milk is an entirely different body from that of cow's milk, and contends that we must not fasten on the mode of preparation an opprobrium that belongs at the start to the inherent nature of the artificial food itself. From a few carefully conducted experiments with infants from three to five months old he concludes that the casein of cow's milk is about equally assimilable whether the milk be boiled, pasteurized, or sterilized. For older children Bendix⁴ has made a somewhat similar observation. Three children (twenty-one months, two, and two and a half years) were fed for two equal periods (four, six, and seven days respectively) upon a mixed diet consisting largely of milk, in the first period the milk being sterilized, and in the second pasteurized, most careful estimation of ingesta and excreta being made. This author's conclusions are, briefly, that in the healthy child there is no difference between the two forms of milk in their nitrogenous and fat-values, and that the one is as readily digested and assimilated as the other. In a child whose digestive power is diminished through insufficiency of bile, assimilation is diminished, but equally for the two forms of milk. He has never observed sterilized milk produce the slightest digestive trouble; on the contrary, the general state and appetite remain good, the stools normal, and growth regular. This being the case, he advises the use of sterilized milk as an absolute safeguard against disease. It may here be observed that the periods of observation, only a few days, are entirely too short to offer results of much practical value, and, besides, the children were fed upon a mixed diet, and all three were past the age with which this discussion is most prominently concerned. Budin and Chavane⁵ also speak favorably of sterilized milk, which they administer undiluted even to the youngest infants, "because the addition of water very greatly decreases the nutritive value of the milk in proportion to its bulk." Further reason for this is found in Chavane's assertion that "when the milk is raised to a temperature of 100° C. the casein undergoes certain modifications which rendered the digestion

¹ *Zeitschrift f. Hygiene*, 1894, xvii. S. 272.

² *N. Y. Med. Jour.*, April 13, 1895.

³ *Beiträge zur Kenntniss des Frauencaseins*, Basel and Leipsic, 1894.

⁴ *Jahrbuch f. Kinderheilk.*, Bd. xxxviii. S. 393.

⁵ *Jour. des Praticiens*, July 18, 1894.

much easier." Tarnier, in the discussion of the paper, also confirmed this statement, but added that milk thus treated could not be properly considered sterilized milk.

In closing the subject we wish to state that we consider the process of sterilization one of the most valuable that has ever been suggested as an aid toward solving that difficult problem, the artificial feeding of infants, its value being almost incalculable in the feeding of that class of children who are obliged to pass the heated term in large cities at a distance from the milk-supply. At the same time, sterilization, like every other method of preparing infants' food, cannot from a clinical standpoint be regarded as universally applicable. A certain small proportion of cases will be encountered that do not thrive upon sterilized milk, and show its lack of nutritive properties or difficulty of assimilation by drifting into a condition of simple atrophy or infantile scurvy, from which they rapidly recover upon the same milk-mixtures either pasteurized or untreated by heat.

INFECTIOUS DISEASES.

Relative Incidence of Disease in Childhood.—Feer¹ has reviewed the statistics of Bâle from 1875 to 1891, and has calculated by age the percentage of cases of diphtheria, scarlatina, measles, and whooping-cough in about 1800 cases. He found that during the first year of life scarlatina affected 1.6 per cent. of the total number of cases of this disease; diphtheria, 2.6 per cent.; measles, 6.3 per cent.; and pertussis, 14.8 per cent.; while in the second year the respective percentages were 4.5, 6.1, 11, and 15.1. After the second year the relative frequency increased for two or three years, and then decreased rapidly after the tenth year. The apparent immunity of early age, he believes, is not in the absence of predisposition, but is due to an ensemble of circumstances creating about the infant an atmosphere unfavorable to infection because of a relative isolation.

Diphtheria.—It is scarcely necessary to refer to the principles upon which blood-serum therapy depends, but they must be kept clearly in mind in any discussion as to the value of the method. Antitoxic therapy, as Behring² says, is that "by means of which we endeavor to combat those infectious diseases which we know are caused by the poisons of microparasites." The antitoxins have, as yet, been found only in the blood of immunized animals. Each antitoxin exerts a curative and protective action only against the single disease-product corresponding to it. Antitoxic therapy is therefore in the highest degree specific therapy. Just what the antitoxin is we do not know, further than that it is a soluble substance and renders the toxin inert. Behring considers the antitoxin to be the product of the "reactionable" albumin of the living cell, which is acted upon by the specific toxin under circumstances that point to a general disturbance of the regulating apparatus of the system (fever, etc.). When an infection is survived,

¹ Correspondenz-Blatt f. Schweizer Aerzte, Nov. 15, 1894.

² Berl. klin. Woch., Sept. 3, 1894.

the amount of antitoxin produced is more than enough to neutralize the toxin. This excess of antitoxin is found in the blood-serum, and can be used to aid other individuals in overcoming the same infection. Upon this one point—namely, the excess of antitoxin in the blood-serum—rests blood-serum therapy. Diphtheria lends itself perhaps more easily than any other of the infectious diseases to this mode of treatment, because of its purely local origin. As Abbott¹ expresses it, “the disease is not a septicemia in the sense of being associated with a distribution throughout the body of the microorganisms causing it, but is strictly a toxemia primarily, though a septic condition may be engrafted later.” Roux’s paper² before the International Congress of Hygiene and Demography at Buda-Pesth is comprehensive and covers the whole subject, from the cultivation of the bacilli to a discussion of the results of serum-therapy. The toxin accumulates in broth-cultures slowly, under ordinary conditions requiring several months for its proper development. This can be reduced to one month by passing a current of moist air over the culture, the reaction of which at the end of this time should be strongly alkaline. It is then filtered through a Chamberland filter, and can be preserved in the dark in well-stoppered bottles, the virulence declining very slowly. To be standard, the strength of this should be such that 0.1 cc. would kill a guinea-pig of 500 grams’ weight in from forty-eight to sixty hours. All diphtheria-bacilli that are apparently of the same virulence toward guinea-pigs do not always produce the same amount of toxin in culture. The first step in immunizing an animal is to avoid too strong a dose of the toxin at first. This can be done by diluting with Gram’s solution of iodine, and using 0.5 cc. of the mixture for the first dose; this is repeated every few days for several weeks, and then the amount can be increased or the proportion of iodine diminished; ultimately the toxin is given pure. If the animal begins to lose in weight, the injections should be suspended immediately. Behring states that an animal furnishes a serum the antitoxic properties of which are stronger in proportion to its sensitiveness to the toxin. Although the horse bears the toxin very well, Roux has chosen it as the best for obtaining the antitoxic serum, because horse-serum, even in large doses, does no harm to man, because of the great amount of antitoxic serum it furnishes, and because of the rapidity with which it can be obtained. Serum containing the antitoxin, when mixed with a culture containing the toxin, renders the latter inert, an injection of the mixture into an animal producing no result. In this way the antitoxin-strength of the serum can be measured. Ehrlich has fixed as the immunizing unit 0.1 cc. of serum, which, when mixed with 0.9 cc. of normal toxin, neutralizes the latter, so that no effect is produced when all is injected under the skin of a guinea-pig. If the toxin and antitoxin are injected separately, but at the same time, no effect is produced, and the same result is obtained if the antitoxin is given first. If the toxin is given first, the amount of antitoxin must be increased in proportion to the interval. Similar results were

¹ *Med. News*, Nov. 17, 1894.

² *Lancet*, Sept. 22, 1894.

obtained when cultures of the living bacilli were injected. The results were much less satisfactory in experimental diphtheria associated with other microbes, especially streptococci. As applied to human diphtheria, antitoxin was first used in the Hôpital des Enfants-Malades in Paris, with a reduction of the mortality in 448 cases to 24.33 per cent., as against 51.71 per cent. for 3971 cases occurring from 1890 to 1894. In no case was there any untoward result which could be ascribed to the treatment, except a slight urticaria. The beneficial effects of the serum were a marked improvement in the general condition; a cessation of the growth of membrane within twenty-four hours, and disappearance of the membrane after thirty-six to seventy-two hours, with rarely a longer persistence; a return of the temperature to normal; a diminution in the amount and frequency of albuminuria; and the appearance less often of such diphtheric sequelæ as paralysis. Of the 448 cases, 120 were classed as pure angina, due only to the Klebs-Loeffler bacillus. The mortality in these was 7.5 per cent. Of the cases of mixed infection, those associated with streptococci were most fatal, with a mortality of 34.28 per cent. Similar observations were made in cases of croup, the general mortality of operated cases being 46.28 per cent. Twelve cases of pure diphtheric croup died, after tracheotomy, of bronchopneumonia due to streptococci, the infection probably occurring in the hospital. It is hoped that the need for tracheotomy will become less and less by using intubation and early injections of antitoxin. In the foregoing series the only local treatment consisted in irrigations with boiled water or liq. sodæ chlorinat., 5 per cent. That the reduction in the mortality was probably not due to a mild epidemic is shown by the results obtained in the Hôpital Trousseau during the same period. The antitoxin was not used there, and of 520 cases, 316 died, a mortality of 60 per cent.

It will be of interest here to refer to Moisard's report¹ to the Société médicale des Hôpitaux, of the statistics in the Hôpital Trousseau with antitoxin. During October and November, 1894, 302 children were admitted to the "doubtful" wards, and were at once injected with 20 cc. of serum. Later, 53 were recognized as not diphtheria, and remained in these wards until recovery, none contracting diphtheria: 249 children were admitted to the diphtheria wards, and at the expiration of Moisard's term 18 were still under treatment. Of the remaining 231, 34 died, or a mortality of 14.7 per cent. This is even better than Roux's report (v. supra), and Moisard attributes the improvement over Roux's figures rather to superior accommodations for isolation than to a milder nature of the epidemic. He was able to isolate not only all the cases of bronchopneumonia, but all those with pulmonary symptoms, and few of all the cases developed lung-complications. Formerly, it was often noticed that tracheotomies that had been doing well would develop bronchopneumonia and die after the entrance into the same room of a tracheotomy-patient having already either bronchopneumonia or a diphtheria of mixed infection. Moisard is not of the opinion

¹ Med. Press, Jan. 9, 1895.

that intubation will entirely supplant the need for tracheotomy. The sequels of the serum-therapy, while of little importance, must still be recognized. They seemed in one series of cases to follow the use of serum from certain horses. There were, in all, 14 cases of urticaria, 9 of scarlatiniform erythema, 9 of polymorphous erythema, and 1 of purpura.

Emmerich¹ believes that the serum-treatment of infectious diseases is, without doubt, the therapy of the future. It is as yet uncertain in its results in human beings, because the healing substances are in too great a dilution in the serum. Only in the lower animals can a sufficient amount be injected to overcome with certainty a fatal infection. When these healing bodies can be isolated from the serum and can be obtained in exact doses, a result which is possible and will at some time be attained, then the method will be perfected. A priori, not much can be expected from the antitoxin in Munich, because the cases of diphtheria there are mostly of mixed infection, streptococci usually being found with the Klebs-Loeffler bacillus, and sometimes staphylococci; and careful examination of the fatal cases in the Kinderspital has shown that death was invariably caused by septicemia. Another point is that animals artificially immunized against one infection seem to become more susceptible to others, which may explain the streptococcus-pneumonias observed by Von Ranke in several cases of diphtheria treated with the antitoxin. With a view to finding the source of this mixed infection, Pasquay investigated the canal-water of Munich, and obtained from it the bacillus pyogenes fœtidus and a streptococcus like the one often found in diphtheria. Karlinski,² as a result of a careful series of experiments on his own person, concludes that the diphtherie-heilserum influences in no way the metabolism of a healthy organism, and that the albuminuria in diphtheria-cases treated with antitoxin should be ascribed to the disease rather than to the remedy.

Buchner³ points out the difference between tuberculin and diphtheria-antitoxin, showing that the failure of the former does not necessarily imply the failure of the latter. Tuberculin is a substance the effect of which is to set up in the human body a reaction that shall produce the healing factors. The diphtheria-antitoxin, on the other hand, is the product of this reaction in the bodies of lower animals. There is also a great difference between the two diseases, tuberculosis being a pure infection of a chronic nature, while diphtheria is a bacterial intoxication with an acute course. While at first skeptical as to the harmlessness of the antitoxin, Buchner's experience with it has set his mind at rest on this point. The serum shows great stability, resisting changes of light and temperature to a considerable degree. The action is not like that of a ferment, but each definite amount of antitoxin neutralizes a certain amount of toxin. Final judgment on the treatment, he thinks, cannot yet be given.

Von Ranke⁴ describes his first experience with antitoxic serum obtained

¹ Münch. med. Woch., Nov. 6, 1894.

² Wien. med. Woch., Feb. 16, 1895.

³ Münch. med. Woch., Nov. 6, 1894.

⁴ Ibid.

from Behring in 1893. Of the 8 cases in which it was used, 7 died with lobular pneumonia. The dose at first was 1 cc., and later 5 cc. [It does not seem probable, in the light of subsequent publications from many sources, that there can be in these cases any relation of cause and effect.] Von Ranke's subsequent experiences with the antitoxin were more favorable, but the number of cases is too small to furnish any conclusions. Three months later,¹ he is of the firm conviction that Behring's serum is a remedy that far surpasses all other known means of combating diphtheria. He used it in 95 cases, with a mortality of 22 per cent. Cultures were made from 67 cases, 8 of which were pure diphtheria, 3 contained no Loeffler bacilli, the remaining 56 being a mixed infection of streptococci with the diphtheria-bacillus. This is interesting as bearing on Emmerich's prognosis as to a possibly unsuccessful result of serum-therapy in Munich. Von Ranke asserts that the decrease in mortality is not due to an increase in the number of mild cases sent to the hospital: 54 of the cases were admitted with symptoms of laryngeal stenosis, which subsided in 17 after the injections; in the remaining 37 intubation was practised, with a mortality of 29.7 per cent. Although the best results follow the early use of the antitoxin, yet he believes it is not without power for good when used late in the course of the disease. Skin-eruptions occurred in several cases, and a febrile joint-affection in 1, but in no case could any injurious action be observed upon the heart, kidneys, or other organs.

Ritter² analyzes the bacteriologic investigations of 324 cases of suspected diphtheria, and of 36 postmortem examinations following true cases of the disease, the results of which give the Klebs-Loeffler bacillus as the original cause of diphtheria. This germ sets up in the mucous membrane upon which it settles a high degree of inflammation, to which the mucous membrane of the larynx and trachea usually responds with a fibrinous exudation, while that of the pharynx gives a strong cell-infiltration and becomes necrotic after the penetration of streptococci. He gives³ the results of the serum-therapy in 26 cases, with a mortality of 4, or 15.3 per cent. In one of the fatal cases the membrane spread, in spite of the injections, downward into the large and small bronchi. Heubner,⁴ as a result of his first experience with the antitoxin, from November, 1892, to June, 1893, concludes that while the serum had a marked influence on the course of diphtheria, yet it did not seem to be specific. Comparison of results was slightly in favor of the antitoxin, and, in view of the absence of untoward results due to the serum, Heubner thinks that further trial should be made. He gives⁵ some practical hints as to the method of making the injections, and mentions, as points to be observed in the further course of the case, the extent of the membrane and the degree of glandular involvement, the temperature, the urine, and the condition of the heart and the circulation.

¹ Münch. med. Woch., Feb. 19, 1895.

² Berlin Klinik, July, 1894.

³ Berl. klin. Woch., Nov. 12, 1894.

⁴ Jahrb. f. Kinderheilk., Bd. xxxviii, S. 221.

⁵ Deutsch. med. Woch., Sept. 6, 1894.

Kossel¹ discusses the principles of blood-serum therapy as applied to diphtheria. He also gives some further observations on the action of Behring's diphtherie-heilserum based on clinical observations.² In favor of its harmlessness he quotes Heubner,³ Koerte,⁴ Katz,⁵ Roux, Martin, and Chaillou,⁶ Ehrlich, Kossel, and Wassermann.⁷ Among the first to report the occurrence of multiform skin-eruptions associated with painful joints and fever were Lublinski,⁸ Scholz,⁹ Cnyrim,¹⁰ and Mendel.¹¹ [That these manifestations are undoubtedly due to the administration of antitoxic serum is so well established that it will be unnecessary to refer to more of the numerous reports on this point.] Kossel¹² is inclined to attribute these sequels not to the antitoxin nor to the phenol, but to the blood-serum. Why this should act so cannot yet be determined. It is possible that the serum of one animal might have this power, either naturally or acquired during the process of immunization, while the serum of another animal of the same species might not possess it. It is more probable that the species of animal determines the presence or absence of sequels. Cow-serum, which Kossel used largely, seemed more innocuous than that from any other animal. Up to the time of his paper (December) he had used the serum in 117 cases of diphtheria with a mortality of 13, or 11.1 per cent. The percentage of recoveries in the 23 cases of tracheotomy was 47.8. In those that recovered the tube was removed, on an average, after three or four days. In no case in which the larynx was not primarily involved did symptoms of stenosis arise. Kossel agrees with the French observers, who report an earlier disappearance of the membrane than formerly. He has also seen in those cases treated early an almost critical lowering of temperature. The action on the kidneys seemed to be favorable, over half of the 104 recoveries showing no albuminuria. Postdiphtheric paralyses were observed in 19 cases, certainly below the average. Cardiac disturbances directly following the use of the antitoxin were not observed. Heart-symptoms arose in 5 cases, from the fifth to the seventh day: 3 of these had marked albuminuria and died, the others recovering. No relapse was observed in the hospital, and but one child, four weeks after dismissal, went through a mild angina of a few days' duration. Kossel concludes "that one cannot expect to cure every case of diphtheria with serum, but that with a sufficient dose recovery will follow with certainty in all cases of fresh, uncomplicated diphtheria. The prognosis is also much better, even in the later stages of the disease, than without the serum-treatment."

Koerte¹³ treated 121 cases with the antitoxin, with a mortality of 33½ per cent. Before the use of the serum, and when the supply failed, the mortality was 50 per cent. The figures bore out Behring's postulate that

¹ Deutsch. med. Woch., Oct. 25, 1894. ² Ibid., Dec. 20, 1894. ³ Ibid., Sept. 6, 1894.

⁴ Berl. klin. Woch., Nov. 12, 1894.

⁵ Ibid., July 16, 1894.

⁶ Annal. de l'Inst. Pasteur, viii., No. 9, 1894.

⁷ Deutsch. med. Woch., Apr. 19, 1894.

⁸ Ibid., Nov. 8, 1894.

⁹ Ibid., Nov. 15, 1894.

¹⁰ Ibid., Nov. 29, 1894.

¹¹ Berl. klin. Woch., Nov. 26, 1894.

¹² Loc. cit.

¹³ Berl. klin. Woch., Nov. 12, 1894.

favorable results are more likely to follow the earlier the injection is made. No injurious effects were noticed, urticaria occurring but nine times. No influence on the temperature or membrane was observed in severe cases, but the general condition was often greatly improved. Koerte makes the point that while the serum is effective against true diphtheria, yet the clinicians cannot, like the bacteriologists, exclude from the term diphtheria those cases of mixed infection that are usually severe, and hence that we cannot in this sense cure all cases of diphtheria. Although the results thus far published are favorable, final judgment can only be based on a long-continued observation through many epidemics of this changeable disease.

White,¹ in reporting favorable results following the use of the antitoxin in the Willard Parker Hospital, N. Y., defines the grounds on which the remedy must be tested. Thus, diphtheria varies in mortality in different epidemics and in different months of the year. The older the patient the better the prognosis, the mortality in children under five years being nearly 50 per cent. When death is due to the toxin of diphtheria, it usually occurs before the thirteenth day, so that a remedy that will prolong life beyond that point carries the patient out of nearly all danger. Those cases that have no false membrane in the nose or larynx generally recover. In a series of 20 complicated cases with an average age of three years the mortality was 25 per cent. Katz² reports for Baginsky the results following the use of serum in the K.-u.-K.-Friedrich Kinderkrankenhaus. The mortality from the opening of the hospital in August, 1890, until the end of 1893 was 38.9 per cent. (421 deaths in 1081 cases). From January 1 to March 14, 1894, there were 38 deaths in 86 cases, 41.8 per cent. mortality. From March 14 to June 20, 128 cases were treated with antitoxin, with a mortality of 13.2 per cent. For various reasons 23 cases did not receive the antitoxin, but, even including these with their 8 deaths, the total mortality was 16.5 per cent. A later publication from the same observers³ gives in detail the results in 167 cases, including the foregoing 128. There were 24 deaths, or a mortality of 14.3 per cent. In reply to Hansemann's⁴ criticism of a diagnosis based solely on the presence of the Loeffler bacillus, Baginsky says: "We do not make the diagnosis clinically or bacteriologically, but the bacteriologic examination, used as a newly introduced and very valuable method of clinical investigation, determines for us the diagnosis based on the clinical manifestations that are present." After careful study the heart-symptoms are ascribed to the disease. Katz concludes the article by stating: "At the present time we do not look on the diphtheria-antitoxin as a cure-all, as an agent working unconditionally in every case, including the most doubtful, but we are of the conviction that it is a remedy that in the majority of cases modifies the course of diphtheria in a most favorable degree."

Bokai⁵ reports 120 cases of diphtheria treated by antitoxin in the Buda-

¹ Med. Record, Nov. 17, 1894.

² Berl. klin. Woch., July 16, 1894.

³ Archiv f. Kinderh., Bd. xviii. S. 321.

⁴ Vide infra.

⁵ Deutsch. med. Woch., April 11, 1895.

Pesth Hospital, the mortality being 25.8 per cent. as compared with 60.2 per cent. for the corresponding period of the three preceding years. Almost all the cases were of mixed infection, the Klebs-Loeffler bacillus being present in all but 5; 63 showed laryngeal stenosis, 49 requiring intubation, with a mortality of 43 per cent. On an average the tube was removed twenty-two hours earlier than formerly. Albuminuria occurred in 53 cases, 13 showing it before the injections; it did not occur in some cases of laryngeal and tracheal involvement in which large doses of serum were administered. The data were not sufficient to determine whether paralysis and heart-failure occurred more frequently than formerly or not, but the author thinks it reasonable to expect that more paralyzes will be seen since a larger number of grave cases recover.

Goebel¹ reports relapses of diphtheria in 2 patients, the first and second attacks in each instance being treated by injections of antitoxin. The patients received in the first attacks 1500 and 1000 units respectively, and in the relapses 1600 and 1500 units, recovery ensuing.

Concerning immunization, Behring's² latest communication announces that the dose (60 units) at first considered sufficient is too small for some cases, and that 150 units had better be given in all cases. Even this dose is not always sufficient when the infection is virulent and the period of incubation nearly over. In such cases a full dose of No. 1, 600 units, may not be sufficient to prevent the development of the disease. An attack following the injection is usually mild. In 10,000 cases immunized, only 10 contracted diphtheria. The antitoxin is excreted by the urine, and immunity depending upon it ceases when all is eliminated. The larger the total dose, the longer the immunity, and smaller doses at intervals are more serviceable than one large dose. Periodic immunization when diphtheria is not prevalent is not to be recommended.

Berg³ presents a thorough paper on the treatment of diphtheria. He thinks that one of the most important points is prophylaxis, the necessary elements in which have been made clear since the discovery of the Loeffler bacillus. Isolation of the patient should be prompt and complete, and maintained so long as the germs persist in the throat. At the end of this time disinfection of the room and furniture should be carefully done. For the local treatment the aims are to remove the toxalbumins, to destroy the bacilli, to hasten the separation of the false membrane, and to relieve dyspnea arising from obstruction of the larynx by the false membrane. In the Willard Parker Hospital various solutions were used locally. These are fully discussed in a paper by White to be noticed later. In pharyngeal diphtheria Loeffler's toluol solution may be used. It is, of course, inapplicable in laryngeal diphtheria, and here calomel sublimations are of benefit, probably having more of a constitutional than a local action. For the relief of the stenosis, intubation is to be preferred to tracheotomy, the latter proced-

¹ Deutsch. med. Woch., Jan. 10, 1895.

² Ibid., Nov. 15, 1894.

³ Med. Record, Jan. 12, 1895.

ure being limited to cases not relieved by intubation, or those in which the membrane has spread below the tube. The object of the constitutional treatment is to combat the effects of the toxin, and the remedies used have been selected either empirically, as mercuric chlorid and tincture of ferric chlorid, or symptomatically, as digitalis, strychnin, etc., or rationally, as the antitoxin. "If all that is claimed for the last proves true, it will, as is always the case with rational remedies, replace the empirical absolutely. In view of the fact that the most reliable observers on the other side of the Atlantic report such a vast improvement in the death-rate from true diphtheria, it is proper for us to look to the serum-therapy as applied in this disease with a great deal of hope of benefit for its use in this country; but in view of the discrepancy between the results obtained by present methods of treatment in this country, as compared with results from the same treatment abroad, we must suspend judgment as to the value of antitoxin-treatment in this country until we shall have proved by the treatment of thousands of cases as great a reduction in our present death-rate, relatively, as they have succeeded in obtaining in Europe."

Foster¹ tabulates the cases of diphtheria reported in the various journals. Of 2740 cases, including those requiring tracheotomy and intubation, treated with antitoxin, 509 died—18.54 per cent. Of 4445 cases not treated with the antitoxin, 2017 died—45.36 per cent. All the cases recovered when the antitoxin was injected on the first day of the disease; 2.83 per cent. died when the injections were begun on the second day; 9.99 per cent. died when first treated with it on the third day; 20 per cent. died when first treated on the fourth day; 33.33 per cent. when the injections were begun on the fifth day; and 41.38 per cent. when they were begun after the fifth day.

Widerhofer² treated with the antitoxin 100 cases of diphtheria, all of them, with few exceptions, being severe or grave. The mortality was 24 per cent., a reduction of more than one-half. His conclusions are—1. There is no doubt that in certain forms of diphtheria, and by no means only in light cases, Behring's antitoxin exerts such a favorable influence that no other mode of treatment can be compared with it. 2. Diphtheria-cases presenting the gravest symptoms, when the serum is used during the first three days, are those that show the most brilliant results; the cases, however, must be pure diphtheria, and not those of mixed infection with other bacteria, especially streptococci. 3. Behring is undoubtedly correct in saying, "Beyond the third or fourth day the action of the serum is doubtful," but this does not mean that its use would be in vain. 4. In the beginning of laryngeal cases good results were obtained even after some degree of stenosis; but if the process has spread below the larynx, not much can be accomplished, and practically nothing when the smaller bronchi are involved. 5. The investigations show that serum-therapy will decidedly lower the mortality in diphtheria. 6. Injurious effects from the antitoxin could not be

¹ Med. News, Feb. 2, 1895.

² Deutsch. med. Woch., Jan. 10, 1895.

seen. 7. Diphtheric sequelæ were found as before the introduction of the new treatment, though possibly less frequent and less severe. 8. Local effect from the injection was limited to the appearance of urticaria in a few cases. He closes with the emphatic declaration: "On the first five points my belief is firm; what I have written I have seen, and what I have seen that I believe."

Schroeder¹ in 63 cases treated with antitoxin lost 8, or 12.69 per cent. Tracheotomy was performed in 31 cases with the wonderfully low mortality of 3, or 9.67 per cent. A skin-eruption was observed 7 times, following the antitoxin. Three of the fatal cases showed more extensive fatty degeneration of the heart than is usual in diphtheria, and in some of the convalescents severe cardiac symptoms arose. Profuse sweating was noticed after some of the injections.

Washbourn, Goodall, and Card² report 80 cases treated with the antitoxin, and give observations on the bacteriology. Diphtheria-bacilli were present in 61 cases, and in these the mortality was 21.3 per cent., as compared with 38.8 per cent. obtained from former statistics. Bacteriologically, the cases of pure angina gave the highest mortality, 30 cases with 8 deaths—26.6 per cent.—while in the 11 anginas associated with streptococci there was but 1 death, 9 per cent., these figures practically reversing those obtained by Roux. The authors were favorably impressed with the working of the antitoxin.

Hansemann,³ in a paper read before the Berlin Medical Society on diphtheria and its serum-therapy, criticises the methods of modern scientific investigators as being liable to two sources of error: the first, that of accepting as fundamental principles questions that are not entirely removed from the field of theory; the second, the inability to sift out the good from the bad in the mass of investigations in any one line, and to obtain a comprehensive understanding of the facts. In applying this to diphtheria he does not consider the Klebs-Loeffler bacillus to be the single etiologic factor in cases of Bretonneau's diphtheria, for the reasons that it is not present in every case; it is never alone; it may be found where diphtheria does not exist; and it does not produce effects in lower animals similar to those observed in human beings affected with diphtheria. In reply to the demand of the bacteriologists that those cases only shall be called diphtheria that show the presence of the Klebs-Loeffler bacillus, all other cases being called pseudodiphtheria or diphtheroid, Hansemann says that this would exclude many cases manifestly diphtheria, and would include many cases that have nothing else in common with diphtheria save the presence of the Klebs-Loeffler bacillus. While admitting that it is found in many cases of diphtheria, and that it may play a more or less important part in their etiology, he cannot consider it as the cause of Bretonneau's diphtheria. In turning to the serum-therapy, he states that the two propositions upon which

¹ Münch. med. Woch., Apr. 4, 1895.

² Brit. Med. Jour., Dec. 22, 1894.

³ Berl. klin. Woch., Dec. 10, 1894.

it rests are—that natural recovery from an infectious disease is due to a sudden immunization brought about by the disease itself, and that this does so by causing the formation of an antitoxin that neutralizes the toxin. The first of these is still a theory not yet proved, and the antitoxin is an hypothesis and has not yet been seen. It is well known that certain animals can be rendered immune toward the Loeffler bacillus, and that this immunity can be transferred to other animals through the blood-serum of the protected. There is no occasion, even from a theoretical standpoint, for using this blood-serum in the treatment of Bretonneau's diphtheria in human beings, "for, in the first place, animals act very differently from man toward poisons; and secondly, it is not diphtheria that is cured in the animals, but the sickness produced by the Loeffler bacilli." The practical application of serum-therapy and the assertion that it immunizes, cures, and is uninjurious are discussed at length, and the following conclusions made: 1. There exist no scientific, theoretic, or experimental grounds for accepting the so-called diphtherie-heilserum as a specific remedy against diphtheria in the human race. 2. A proof of the specific healing power of the serum in man has not yet been furnished by practical experience. 3. The remedy can at times do harm, for it exerts a destructive influence on the blood and acts injuriously on the kidneys.

Baginsky¹ discusses Hansemann's paper in detail. He asserts that the value of the serum-therapy must be decided not on theoretic but on clinical grounds, and that more weight must be given to the careful study of the effect in single cases than to the mere figures of the recoveries. He has seen good results follow the use of the serum, and recovery ensue in many cases that, according to all his former experiences, would certainly have been considered fatal cases. He is therefore convinced that this is a valuable measure in the treatment of diphtheria. The children brought to the hospital were not considered as mere subjects to be used for testing the value of an untried remedy, but the customary measures of internal and local medication were adopted and then the injections were used. The better results thus obtained over the former methods can, then, be justly ascribed to the antitoxin. The dose of the antitoxin had to be decided empirically, larger doses being given to those cases of longer duration or of apparently greater severity than to the early or mild cases. The usual maximum was 4000 antitoxin-units. This was exceeded in some cases with apparently no advantage. From 1000 to 2000 units in young children seem to accomplish more than much larger doses in older children. Beneficial effects from the antitoxin are not obtained in every case, even when it is used early. This is probably due to the large amount or excessive virulence of the infection, a fact that has often been noted in connection with scarlet fever and cholera. In such cases irreparable organic lesions probably occur with frightful rapidity. Concerning sequels or phenomena attributable to the antitoxin, some slight urticaria was noticed, but Baginsky has seen only twice the severer erythema

¹ Berl. klin. Woch., Dec. 24, 1894.

with fever and joint-involvement. He does not think, however, that the possible occurrence of these sequels would justify the abandonment of serum-therapy. He recollects the appearance of erythema formerly when turpentine was used extensively in diphtheria. With regard to the action of the serum on the kidneys, Baginsky not only flatly contradicts Hansemann's statement that it is injurious, but also asserts that when there already existed a renal complication, improvement was noticed following the use of the antitoxin. The same cannot positively be affirmed concerning the heart, as the fatal cases in which antitoxin had been used died of heart-failure, and in many of those that recovered, disturbance of the heart-rhythm was noticed. This may have been due to the antitoxin or to the character of the epidemic, and the same may be said of the infrequency of postdiphtheric paralysis. Judgment on these points must be suspended until the antitoxin has been used in several epidemics. In the fatal cases the heart-muscle showed nothing further than the changes that have always been ascribed to the disease. In reply to Benda's remark on the possibility of miliary tuberculosis arising after serum-injection, Baginsky shows that it occurs as often in cases that have not been treated with the antitoxin. He makes a timely appeal for an unbiassed, dispassionate, and calm attitude on all sides while a thorough test is made, this, in view of the changing nature of diphtheria, necessarily demanding time. In the same discussion Liebreich criticised the Berlin hospital statistics as misleading. Formerly only the worst cases were sent to the hospitals, thus accounting for the high mortality, but now, he stated, many light cases were sent for treatment, thus lowering the mortality.

Winters,¹ one of the visiting physicians to the Willard Parker Hospital, disagrees with his colleagues as to the beneficial effects following the use of the antitoxin. During three months he observed 154 cases so treated, and "in not a single case has there been the least evidence that the formation of the pseudomembrane was checked, that the exfoliation of the pseudomembrane was hastened, or that the throat was free from membrane earlier than in the cases that have not been treated by antitoxin. In not a single septic case has the antitoxin made the least impression on the symptoms. The toxemia has not in one instance been relieved or lessened. There has been no indication, in the character or frequency of the pulse or in the general condition of the patient, that a specific for the toxemia had been administered." He does not see the reason for using antitoxin in laryngeal diphtheria, when the symptoms are only those of stenosis, and not of toxemia. For the first three months of 1894 the death-rate in the hospital without antitoxin was 32 per cent. In the corresponding time in 1895, with antitoxin, it was 28 per cent., a result due to the class of cases treated, some of them showing no clinical evidences of diphtheria, the diagnosis being made from a bacteriologic standpoint only. As to the early treatment of diphtheria with the antitoxin, it may be definitely and confidently stated that cases of

¹ Med. Record, April 20, 1895.

diphtheria at the present time almost invariably recover under any method of treatment if brought under proper hygienic surroundings and surveillance on the first day of the disease. Just as there are instances of extreme susceptibility to certain drugs, so there exists in some individuals a susceptibility to the antitoxin, which accounts for the sudden death of a young woman in Brooklyn immediately following the injection of the antitoxin. "The antitoxin is therefore opposed, first, because it does not neutralize the toxemia; nor favorably influence any of the clinical manifestations of diphtheria; and, second, on account of its immediate danger to life through its influence on the kidneys and on the nervous system, and, remotely, through its influence on the blood."

Hagenbach¹ reports a severe case of diphtheria treated by Behring's "heilserum." Three days after the injection petechiæ broke out on the neck and spread over the whole body; vomiting set in on the seventh day, and death occurred on the tenth. The autopsy showed hemorrhagic gastro-enteritis, a high degree of fatty degeneration of the heart, and parenchymatous nephritis.

Kassowitz² of Vienna criticises the conclusions upon which Behring's theory of immunization and serum-therapy is based, believing that it is founded upon far too insufficient experimental work, as set forth in Behring's publications. He ranks himself as an opponent of serum-therapy in its present status, for the following reasons: That attempted immunization toward diphtheria has failed repeatedly; that relapses have occurred in children treated in the first attack with antitoxin; that injection on the first or second day has not always averted a fatal issue, death in some cases occurring as a result of the diphtheria-toxin; that post-diphtheric sequels seem as frequent as formerly; that the antitoxin has no sudden antipyretic action—the membrane does not seem to be loosened earlier or its formation checked; and, finally, that the total mortality for diphtheria in Berlin has not been lowered. Drasche³ of Vienna also opposes the serum-therapy, because clinical observations show that the working of the diphtheria-toxin is not prevented.

At the meeting of the American Pediatric Society, May 28, 1895, it was the opinion of the majority that the evidence thus far produced regarding the effects of diphtheria-antitoxin serum justifies its further and extensive trial.⁴ Of the same nature was the general consensus of opinion expressed in the discussion before the Association of American Physicians,⁵ the speakers being Welch, Mason, Jacobi, Billings, Abbott, Williams, and Osler.

Smirnow⁶ has endeavored to obtain the antitoxin without the intervention of the animal organism. After negative experiments with normal blood-serum and hydrogen dioxid, positive results were obtained by electrolysis; normal serum, after electrolysis, producing a febrile reaction when

¹ *Corresp.-Blatt f. Schweiz. Aerzte*, Jan. 1, 1895.

² *Ibid.*, Feb. 2, Feb. 9, Feb. 16.

³ *Ibid.*, June 15, 1895.

⁴ *Wien. med. Woch.*, Nos. 5-8, 1895.

⁵ *Med. News*, June 8, 1895.

⁶ *Berl. klin. Woch.*, July 23, 1894.

injected into animals. Blood-serum cultures containing the diphtheria-toxin were electrolyzed and the toxin was converted into antitoxin. Rabbits were injected with virulent diphtheria-cultures, and after twenty-four hours were treated with this antitoxin, which produced a rise of temperature in two or three hours, and then effected a cure, usually with a single injection. It may be possible by this method to prepare stronger antitoxins than by the method of immunization.

Klebs,¹ acting on the theory that pathogenic bacteria, like all other living organisms, secrete substances that are poisonous to themselves, has obtained from artificial cultures antidiphtherin, a substance analogous to tuberculocidin and antiphthisin. The secretions of the bacteria are partially toxic, and can be separated into a toxalbumin and a sozalbumin. The latter, from diphtheria-bacilli cultures, is antidiphtherin. As this is to be used so as to kill the bacilli, it must, of course, be applied locally. In 51 cases so treated, 7 died, a mortality of 13.7 per cent.

At the Eighth International Congress of Hygiene and Demography, held at Buda-Pesth, Sept. 2 to 8, 1894, reports were presented by the delegates from various countries on the etiology and prophylaxis of diphtheria. The limitations of this work prevent an extended review of all the papers, so that only brief mention can be made. Loeffler² stated that the cause of diphtheria is now universally accepted to be the specific bacillus, the growth of which is favored by filth in moist and dark dwellings. Epidemics of the disease vary in severity, and often one epidemic will show both light and severe cases. These variations depend on several factors, such as the number and virulence of the bacilli, the association of other bacteria, and individual susceptibility. In prophylaxis early diagnosis and isolation are essential. Roux³ in the French report dealt especially with the civil regulations that should govern the handling of a case of diphtheria, and laid stress on the bacteriologic diagnosis. The antitoxic serum he thought would be of great value from a prophylactic standpoint also. The report from America was made in two papers, that by Welch⁴ giving the results of the bacteriologic investigations that have been pursued by different workers in the United States. One of the most important points, he said, was the identification of the "pseudodiphtheria bacillus," which is not the one differing from the true bacillus only in the absence of virulence. Such a bacillus is undoubtedly a true Klebs-Loeffler bacillus. The term pseudobacillus should be reserved for those bacilli which, although resembling the diphtheria-bacillus, differ from it not only by absence of virulence, but also by cultural peculiarities. The other American paper was by Billings,⁵ reporting the vital statistics for diphtheria and croup, as far as they could be obtained from the census reports. These show that the death-rate from diphtheria is twice as great in the cities as it is in the rural districts, affecting white children under five

¹ Wien. med. Woch., July 28, Sept. 15, 1894, and Med. Record, Dec. 15, 1894.

² Brit. Med. Jour., Sept. 15, 1894.

³ Jour. Am. Med. Assoc., Nov. 24, 1894.

⁴ Am. Jour. Med. Sci., Oct., 1894.

⁵ Brit. Med. Jour., Sept. 15, 1894.

years of age more than any other class. The report from England by Seaton¹ showed that while the rate of deaths from zymotic diseases per 1000 of population had declined with improvements in general hygiene, such as better water-supply, drainage, and sewage-disposal, the death-rate from diphtheria had risen markedly. Oertel's report from Munich² discussed systematically the lines along which investigation should be pursued, dividing the subject into two parts—(a) bacteriologic, (b) epidemiologic and hygienic.

Biggs,³ the director of the New York Bacteriological Laboratory, reports to the city Board of Health the details of the method adopted [which has since been put in force in other cities] for making the bacteriologic examinations in cases suspected to be diphtheria. His assistants, Park and Beebe,⁴ have reported to him the results of examinations in 5611 cases, and also on the investigations pursued in the laboratory. Of the cases examined, about 58 per cent. were true diphtheria, 27 per cent. false or pseudodiphtheria, and 15 per cent. of doubtful character; so that it may be said that 60 per cent. were true and 40 per cent. false diphtheria. Out of 286 cases of membranous croup, 80 per cent. were diphtheria, and 14 per cent. were certainly not diphtheria. The conclusions in brief are—(a) the diphtheria-bacillus of Loeffler is the cause of diphtheria; (b) streptococci are the usual cause of pseudodiphtheria; (c) the mortality of diphtheria was 27 per cent., of pseudodiphtheria less than 2 per cent., so that, although the latter may be proved to be communicable, it is not deemed necessary to enforce isolation.

A. Campbell White⁵ of the Willard Parker Hospital reports the results of an investigation of 84 cases of diphtheria with a view to determining how far the duration of the membrane and the presence of bacilli may be influenced by different local measures. Forty cases were treated with salt-water irrigations alone, 20 with mercuric-chlorid irrigations, and 24 with salt-water irrigation and pyrozone spray. His conclusions are—1. That frequent washing of the air-passages attacked by diphtheria lessens the duration and amount of diphtheric membrane. 2. Antiseptics of sufficient strength to be germicidal are irritating and cause extension and persistence of the false membrane. 3. They may cause systemic poisoning. 4. Spraying (also the pernicious treatment by swabbing) is very inefficient and with young children cannot be accomplished. 5. Frequent cleansing of the throat and the nasal cavities with a bland solution, such as plain warm water or normal salt-solution, is easier of application, is more agreeable to the patient, and does all that any antiseptic solution can accomplish either as regards duration of the membrane or the period of isolation.

In an epidemic of diphtheria Feige⁶ tried pyoktanin locally without good results, and changed to the use of liq. ferri perchlorid. In 37 cases there was but 1 death, and he concludes that the perchlorid is almost a specific.

¹ Brit. Med. Jour., Sept. 15, 1894.

² Med. Record, Sept. 15, 1894.

³ Ibid., Nov. 3, 1894.

⁴ Int. klin. Rundschau, Aug. 24, 1894.

⁵ Ibid., Sept. 29, 1894.

⁶ Therap. Monatshefte, July, 1894.

Babes and Talasescu¹ in verifying the results obtained by various observers were able to attenuate cultures of the diphtheria-bacilli by growing them on thymus bouillon and then heating them for fifteen minutes at 65° C., so that injections of these would confer immunity on animals otherwise susceptible to diphtheria. Also by heat and iodine trichlorid virulent cultures are so attenuated that sheep may be rendered immune in three months, so that their blood-serum will protect guinea-pigs against an injection of twice the usual fatal dose. The filtrate of virulent cultures may be attenuated by dilution with Lugol's solution, this being probably the best method.

Runge² maintains that animal inoculations should be considered as the only decisive method in making the biologic diagnosis of true diphtheria, believing the diphtheria-bacillus that has lost its virulence to be to all intents and purposes a pseudobacillus. As the nonvirulent bacillus has not been observed to regain its virulence, and cannot be cultivated so as to do so, it is urged that cases presenting this, with an absence of the virulent bacillus, be looked upon as cases of pseudodiphtheria, and be spared the annoyance of the isolation necessary in true diphtheria. The author reports 3 cases in one family illustrating his points.

That suppression of urine in the course of diphtheria may occur without the intervention of antitoxin is shown by 3 cases of severe type in children three or four years of age, reported by Wilde.³ In 2 of the cases the suppression occurred in the afebrile period and was accompanied by profuse diarrhea and vomiting. It was of gradual onset, and the urine obtained before total suppression contained a considerable quantity of albumin without casts. The author suggests that the cause of the anuria in these cases may possibly be the result of nerve-degeneration; moreover, the frequent association of an intractable and copious vomiting and diarrhea might indicate a profound interference with the functions of the abdominal sympathetic system, leading to blood-flooding of the splanchnic area, and consequent lowering of the renal blood-pressure to the point at which urinary filtration can no longer occur.

Goodall⁴ also records 6 cases occurring before the introduction of the antitoxin treatment, in which suppression of urine was observed. The symptoms, in addition to anuria, were invariably cardiac failure, and usually vomiting. Almost all the cases showed much local exudation on the fauces, though the anuria in several did not set in until after the membrane had disappeared.

Ansten and Cogill⁵ have made an interesting study of 58 cases of hemorrhagic diphtheria. All were fatal, except one, in which the diagnosis was doubtful and which was treated with the antitoxin. The cutaneous hemorrhages consisted of ecchymoses and purpuric spots. Epistaxis and hema-

¹ Roumanie méd., No. 1, 1894.

² N. Y. Med. Jour., May 11, 1895.

³ Brit. Med. Jour., May 11, 1895.

⁴ Lancet, Feb. 2, 1895.

⁵ Brit. Med. Jour., March 30, 1895.

temesis were frequent. Treatment, including in 11 cases the antitoxin, was of no avail, death as a rule occurring within forty-eight hours after the appearance of the hemorrhages.

Treymann¹ reports a case of hemorrhagic nephritis in a child of three at about the fifteenth day of an attack of diphtheria, in the early part of which large doses of antitoxin had been given. As the nephritis appeared at the beginning of convalescence and shortly after a dose of antitoxin, and as it disappeared in an unusually short time, the author attributes it to the serum. Schwalbe² reports a similar case occurring in a child of ten years not treated with the antitoxin, and urges that the same caution exercised in attributing favorable results to the serum-treatment should also be adopted in assigning to it harmful complications.

Bernarbeig³ has studied the articular complications of diphtheria, 10 cases of which have come under his notice. The larger joints are affected, usually the knee, the onset occurring from the seventh to the fifteenth day of the disease, when the angina is subsiding or is already cured. In the severe anginas the arthritis is usually suppurative, due to a secondary streptococcus-infection, and results fatally. In the mild anginas the joint-affection (which the author considers to be caused by the toxin) is benign, and shows one of three forms: 1. The purely arthralgic, consisting merely of violent pain in the joint, or the arthralgic with local symptoms of pain, swelling, and redness; 2. The serous form, or the arthralgic plus serous effusion into the joint; 3. The periarticular, marked by less pain, the swelling being around the joint.

Hecker⁴ publishes, for future reference, carefully compiled tables of the diphtheria-mortality in thirteen of the larger cities of Germany and in Vienna from 1883 to 1893. They will undoubtedly be of great value, after a time, for purposes of comparison.

Loeffler,⁵ in a paper before the Buda-Pesth Congress, gives the formula of the so-called toluol solution for the local treatment of diphtheria. His reasons for bringing it forward in the face, so to speak, of the blood-serum therapy are—the good results that have followed its use in an extended series of cases (71 cases in private practice, no death; 30 cases in hospital, 5 deaths—mortality 4.9 per cent.); its applicability to all cases, whether of true diphtheria or of mixed infection; the absence of any injurious working; its prophylactic value in destroying at once a source for the spread of the disease; and, finally, its cheapness. While investigating the antiseptic properties of many solutions toward the Klebs-Loeffler bacillus he found that a mixture of alcohol, turpentine, and 2 per cent. phenol was more active than any one of the ingredients alone. This led to a trial of other combinations, the aim being to find a solution that would destroy the bacilli, without harm to the patient, in a space of time so short that the solution would be of practical clinical value. The final outcome of these investiga-

¹ Deutsch. med. Woch., Dec. 20, 1894.

² Ibid.

³ Thèse de Paris, 1894.

⁴ Münch. med. Woch., April 30, 1895.

⁵ Deutsch. med. Woch., Oct. 18, 1894.

tions gave the following formula: Alcohol 60 volumes, toluol 36 volumes, liq. ferri chlorid. 4 volumes. Guinea-pigs that had been inoculated with virulent diphtheria-bacilli could be saved by injecting in the same spot 0.1 cc. of this solution even if four hours had elapsed. After a longer time the action was uncertain, although favorable results have been obtained a few times after a lapse of twenty-four hours. 100 cc. of the solution can take up 16 cc. of water before the toluol will be precipitated. The application of the solution to the mucous membrane of a healthy individual causes a burning sensation lasting a few moments. Repeated energetic applications may produce a slight superficial exudate. Upon this power of penetration and upon its affinity for water depends its activity. It is of great importance that the applications should be begun early, should be thorough, and should be repeated every three or four hours until the temperature sinks to normal, which usually occurs in from twenty-four to forty-eight hours. The pulse lessens its rate, but remains a little accelerated for a day or two after the temperature has become normal. When this occurs and the patient's general condition becomes good, the applications need be made only thrice daily—morning, noon, and evening. In a few days the membrane becomes loosened and is shed in large flakes, but the applications must be continued as long as there is the slightest trace of membrane or deposit in the tonsillar lacunæ, Oertel's secondary membrane sometimes persisting for a week. The following method is recommended for making the application: The superficial mucus having been removed by revolving over the membrane a large piece of cotton held in a long pair of forceps, a fresh piece of cotton is saturated with the solution and pressed firmly for ten seconds against the affected spot. This is to be repeated until the whole membrane has been treated. In grave cases the procedure may be repeated a few moments after the first application. As the patient is liable to cough during the treatment, it is well for the operator to stand to one side and to protect his eyes with glasses. If the applications are sufficiently frequent and thorough, the process does not spread, and in none of the cases already treated has the larynx or nose become involved. Sequels were rarely observed. Clinically, it was found that intense pain, lasting for a few moments, often followed the applications, and to obviate this, menthol was added, the formula then being menthol 10 g., dissolved in toluol to 36 cc., absolute alcohol 60 cc., liq. fer. chlorid. 4 cc. This is the best for true diphtheria. When there is much putrefaction, as often occurs in the cases of mixed infection, the hydrogen sulphid renders the iron inert by converting it into ferric sulphid, and for these cases the ferric solution may be substituted by 2 or 3 cc. of creolin or μ -cresol, absolute alcohol being added up to 100 cc. The solution will keep in dark-glass bottles with glass stoppers for months without spoiling. Aromatic ethers may arise from the iron-solution, but do not at all impair the activity of the mixture. [With certain limitations, it seems to us that this may be a valuable adjunct to the treatment of diphtheria. The great point on which local treatment has failed, thus far, is that some cases seem

to be made distinctly worse by it, and it will be well if this charge cannot be brought against the toluol solution. It is rather difficult to see how the applications could be made properly in cases of primary nasal or laryngeal infection. Even in tonsillar and pharyngeal diphtheria it might be wellnigh impossible to carry out the applications thoroughly with many children. When practicable, it will undoubtedly be of great value.]

Ritter¹ would destroy the primary focus of disease by scraping away the epithelium of the tonsils with a platinum spatula and swabbing thoroughly with a 1 per cent. solution of mercuric cyanide. Then oil of turpentine is to be painted on frequently, and irrigation is to be practised with a 0.1 per cent. solution of mercuric cyanide. These substances are surpassed as antiseptics by mercuric chlorid only, but they are not, like it, unpleasant and poisonous.

W. W. Myers² obtains from the bouillon-culture a toxalbumin by means of filtration, evaporation, precipitation with alcohol and acetic acid, the clear liquid being dialyzed and again precipitated with alcohol: the dried precipitate is the toxalbumin. A 4 per cent. solution of this is used as a local application. [Possibly the nature of this is the same as that of Klebs' anti-diphtherin.]

Hare,³ in discussing the treatment of diphtheria, holds that, while the blood-serum therapy gives us a weapon of undoubted value, we are not yet justified in abandoning all the older measures, which he reviews systematically.

Binet⁴ advises the use of resorcin in 15 times its weight of glycerol. In 43 cases thus treated there were but 4 deaths.

McGillicuddy⁵ says that his death-rate in diphtheria is practically nil since he began using kretol in 20 per cent. solution locally and 2 per cent. internally.

Munn⁶ had a mortality of 2 in 26 cases treated locally with methyl-violet.

Caillé⁷ records an instructive case of diphtheria following the operation of tonsillotomy in a boy of four years, calling attention to the urgent need of preparatory antiseptic irrigation of the nose and throat, as well as of extraction or filling of carious teeth before attempting operation on the tonsils or adenoid growths. One week of preparatory treatment he considers not too long. In the discussion of this paper Koplik suggested that before an operation on the tonsils a bacteriologic culture of a plug from a crypt should be made, in order to exclude the presence of quiescent diphtheric bacilli.

Measles.—J. C. Wilson⁸ reports a house epidemic of measles affecting 3 children and 2 adults. One of the children had the benign hemorrhagic

¹ Therap. Monatshefte, Aug., 1894.

² Therap. Gaz., Jan. 15, 1895.

³ Phys. and Sur., Aug., 1894.

⁴ Arch. of Ped., Sept., 1894.

⁵ Amer. Therap., No. 8, 1894.

⁶ Rev. des Sci. méd., July 15, 1894.

⁷ Pittsburgh Med. Rev., Aug., 1894.

⁸ Med. News, July 21, 1894.

form; the father of the family, aged thirty-seven, died upon the fifth day, having presented the symptoms of the malignant form of the disease.

Varnali¹ of Bucharest reports a case of measles complicated by subcutaneous emphysema in a child ten years of age. The patient, when seen with the disease in full eruption, presented over the whole trunk and neck a subcutaneous emphysema; over the precordial region there was a gaseous tumor the size of an orange. The disease was of four days' duration, and was uncomplicated by bronchopneumonia; the emphysema had appeared suddenly after a paroxysm of coughing followed by vomiting. The child had had an attack of whooping-cough about seven or eight months previously. The author offers the following hypothesis: That the microbe of measles, whether that of Babes or another, had produced in the bronchial vessels a congestion and diapedesis, and that this lesion had caused atelectasis of some pulmonary lobules, with vicarious emphysema of other lobules. In the case of the patient the old lesions left by his whooping-cough, in conjunction with the new, had produced a high intrapulmonary tension, whence the rupture of a vesicle near the hilum and the production of the subcutaneous emphysema by way of the anterior mediastinum. This explanation is in accord with the theory advanced by Barthez and Sanné concerning the production of atelectasis by congestion of the interlobular vessels, in opposition to the theory of Gaertner and Virchow—the theory of the ball-valve.

Scarlet Fever.—Some interesting observations and deductions have been made by Theodor Hase² of St. Petersburg from the study of a large number (2453) of cases of scarlatina. Fifteen cases of true reinfection in scarlatina were observed; here the primary attack was usually light or of moderate severity; in only 3 cases was it severe. The secondary exanthem was always less intense than the primary, and disappeared more quickly. The so-called *pseudorécidive* occurred at the end of the first or middle of the second week, while the true reinfection was observed much later, from the third to the sixth week, and vomiting did not occur at its onset. In cases of associated scarlatina and measles the mortality was somewhat greater when measles appeared after scarlatina, the tendency to bronchopneumonia being much more marked under these circumstances.

Hall and Munn³ report the data of 285 cases of scarlet fever occurring at altitudes of from 4000 to 5500 feet above sea-level. The cases present nothing of unusual interest, and, as the authors state, there seems to be no reason for thinking that this disease is especially modified by altitude.

Wolberg⁴ gives the clinical history of a case of scarlatina associated with variola. There is nothing noteworthy in the case itself, but the actual association of the two diseases is so rare as to demand a passing reference to the paper.

Ashby⁵ has given us a careful paper on the scarlatina-like rashes in

¹ Rev. mens. des Mal. de l'Enfance, May, 1894.

² Jahr. f. Kinderheilk., Bd. xxxix. S. 58.

⁴ Archiv f. Kinderheilk., Bd. xvii. S. 409.

³ Jour. Am. Med. Ass., July 28, 1894.

⁵ Med. Chron., June, 1894.

children. In spite of the well-marked characteristics of scarlatina, he remarks, the difficulties of diagnosis and the perplexities to which they give rise are well known. Scarlet fever may be a practically feverless disease, the temperature not exceeding 99.5° or 100° F. for a couple of evenings; the fauces may be only doubtfully reddened; there may be an absence of the yellow spots so often present on the tonsils; and the whole diagnosis, so far as scarlet fever is concerned, may turn on the character of the red rash. At other times a well-marked red rash makes its appearance in the course of another disease, like pneumonia, or after an operation, or during suppuration of some sort, and much difficulty may be experienced in determining whether or not scarlet fever is present as a complication. The author has seen cases which, during an epidemic of influenza, resembled this protean disease, and yet were accompanied by a rash closely resembling scarlet fever. This association of influenza with a red rash has been noticed by Kramsztyk, who records many cases in a recent epidemic of influenza in Warsaw, and states that he has no doubt that these cases were quite distinct from any scarlatinal infection. On the other hand, Filippow records 16 cases in which influenza was complicated with scarlatina in a mild form.

The disease that at times most closely resembles mild scarlatina is the scarlatina form of rubella. In Ashby's experience some years ago an epidemic of this form of rubella was considered to be mild scarlatina until the first cases admitted to the Children's Hospital and sent to the scarlatina ward promptly developed scarlet fever while the original rash was fading. In the primary disease there was an absence, for the most part, of vomiting; the fever was only slight; a sore throat was generally complained of; and there was slight tonsillitis to be observed on examining the fauces. The rash was general, bright-red, and punctiform, exactly resembling that of a mild case of scarlet fever. Similar epidemics have been described by Filatow and Kramsztyk. In these cases of rubella desquamation is usually absent. Difficulty in diagnosis occurs principally in isolated cases or in the first cases coming under notice. When other cases occur, the long period of incubation would be a valuable aid. The author raises the question whether rubella, when it assumes the scarlatinal type, has a shorter incubation than in the other form. Surgical scarlatina, he believes, is in most instances scarlatina occurring in a subject under surgical care, but in cases in which there is an excessive amount of suppuration there may be a red rash due to septicaemia. The same occurs in scarlatina where there is much suppuration about the neck and fauces, the rash looking at first sight like a second scarlatinous eruption, but it is likely to be more patchy and of a dusker hue. A similar rash may be seen in empyema with much pus-formation. The rash seen in severe cases of diphtheria is no doubt also septic, though it is now a well-recognized fact that a membranous exudation exactly resembling true diphtheria may be present on the fauces in scarlet fever, but the Loeffler bacillus is absent. The inflammatory form of diphtheria is sometimes exceedingly like scarlet fever, beginning with vomiting and high fever, and if there be a

dusky septic rash present, the likeness is especially striking. Among the drugs, belladonna is the only one that produces an erythema liable to be mistaken for scarlet fever. Antipyrin certainly at times produces a rash, but it is more of the type of measles or nettle-rash. The question of desquamation, which is apt to follow all diffuse rashes, especially when there has been fever, is of great importance. The author believes that as indisputable evidence of scarlet fever desquamation is greatly overrated. Mild cases of scarlatina are often not followed by desquamation at all, and differ in no way from other febrile attacks, such as influenza, pneumonia, or typhoid.

Typhoid Fever.—An epidemic of typhoid fever at Montclair, N. J., in 1894, that arose from a polluted milk-supply, gave Noyes¹ an unusual opportunity of collecting observations upon the disease in infancy. He reports in detail a fatal case coming under his own observation in a baby of eleven months, and gives short notes of 7 additional cases, seen by other physicians in the town, in children from eleven months to three years of age. From a consideration of these cases and those already reported in the literature he thinks that typhoid fever in the child is rarely observed, not because it does not occur, but because it is not generally recognized, or is classified, as Henoch has suggested, under the terms "remittent gastric fever" or "febriculæ." The occurrence of actual meningitis, while often most closely simulated by a number of very suspicious symptoms, is really exceedingly rare, being most frequently simulated by a passive congestion of the cerebral vessels from weakness of the heart. The author's own case exhibited very marked cerebral symptoms, such as rise of temperature, vomiting, stiffness of the neck and back amounting to opisthotonos, incoordination of the eyeballs, hypersensitiveness to sound, light, and touch, irregular convulsive movements, especially in the left arm and leg, a peculiar cry, and irregular respiration. Dr. Huber, who saw the case, excluded meningitis, for the reasons that the child was bright enough to notice, there was no tache cérébrale, no scaphoid belly, the vomiting was not propulsive, and the photophobia and hypersensitiveness to sound were less than would be expected in acute meningitis. These symptoms passed away in a few hours after increasing the heart-stimulation.

An interesting statistical study of typhoid fever in childhood has been made by Ssokolow² from the histories of 581 cases. The age of greatest frequency was from four to ten years (63 per cent.), while below four years there were but 15 per cent., and from ten to fifteen years 22 per cent. Sudden onset with vomiting occurred in 3.6 per cent., and with chill in 3.2 per cent. Diarrhea was noted in 34 per cent., constipation in but 9.5 per cent., the former cases running a more protracted course (23.4 days) than the latter (19.8 days). The general mortality was 9 per cent., of which 2 per cent. should be credited to subsequent infections by measles, scarlatina, or diphtheria. The constipated cases gave a mortality of only 1.8 per cent., while the diarrheal cases had 10 per cent. Posttyphoid elevation was observed in 37 per cent. of all cases. Relapses were less frequent than in adult patients,

¹ Med. Rec., July 7, 1894.

² Centralbl. f. innere Med., May 18, 1895.

numbering but 14 single and 4 double recurrences out of the total of 581 cases.

Varicella.—The older view that varicella was a trivial disease of invariably good prognosis has been somewhat modified by the observation of more recent years. In 1884, Henoch published 4 cases of nephritis after varicella, 1 of which terminated fatally, and since then similar cases have been reported by various observers (Clausen, Hoffmann, Rasch, Semtschenko, Rachel, Viehmann, Högyes, Newski, Janssen, Unger, Hagenbach, Demme, and Cassel). Cassel¹ now records 6 cases, out of 12 seen in an epidemic in Berlin in 1894, which showed albuminuria or actual nephritis after the stage of desiccation had begun, the earliest on the fourth or fifth day of the disease. Three of his cases were fatal, 2 of them not directly from nephritis, for 1 died of catarrhal pneumonia, the other of gangrene and double lobar pneumonia, though it is certain the renal mischief largely determined the result. The third case, ten months old, died from nephritis on the twelfth day. Three other fatal cases of postvaricellous nephritis have been reported—1 each by Henoch, Högyes, and Hagenbach. Henoch and Hagenbach speak of acute parenchymatous nephritis, while Högyes states that in his case the convoluted tubules and loops of Henle were alone affected. These cases, therefore, prove very conclusively that the urine in a case of varicella should be as carefully watched as in scarlatina. A fatal case of uncomplicated varicella is recorded by Nisbet.² The child was eight and a half months old, and took the disease from older children of the family. The fatal result is attributed to the fact that the eruption covered every portion of the body, producing practically the same effect as an extensive burn. On the seventh day vesicles appeared on the mucous membrane of the mouth, and death followed on the tenth day.

Vaccinia.—Friedemann³ has made a study of 6 cases of vaccination in very weak nurslings and young children. He confirms the observations of Von Jaksch, Peiper, Wolff, and others, that during the first two weeks of life vaccination is followed by no fever or other constitutional reaction observed so commonly in older children, especially from the fourth month onward. Constitution, he finds, has no effect upon the susceptibility to vaccinia, very young or weakly infants experiencing the same protection against variola as enjoyed by older or healthier subjects. The vaccine fever begins on the fifth, sixth, or seventh day, and lasts till the twelfth day. A more protracted course is evidence of some complication. Of such complications intestinal disturbance is most frequent in the younger, while among older children catarrh of the respiratory tract or of the special sense-organs is the most common. Early vaccination is therefore not only free from danger, but is desirable as conferring a prompt immunity against variola, which is so fatal in the first year, and especially in the first month, of life.

¹ Archiv f. Kinderheilk., Bd. xvii. S. 371.

² Australasian Med. Gaz., Nov. 15, 1894.

³ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 324.

Influenza.—Ferreira of Rio de Janeiro¹ calls attention to some clinical peculiarities of the bronchopneumonia of epidemic influenza. [His experience among children in South America coincides very strikingly with our own observations of this disease, which has been so prevalent among young infants during the past winter.] In the first place, he mentions the unusually low temperature attending serious involvement of the lung. In numerous cases he found temperatures of only 99.6°, or even 98.6° F., while the lungs showed all the physical signs of acute bronchopneumonia. This depression he attributes to a paralysis of the thermogenic centers resulting from the action of the influenza-poison. The greatest danger here is from a false security fostered by the absence of high fever; to avoid this the physical signs and intense prostration must be taken into account. An early tendency to bronchoplegia and pulmonary collapse due to the general adynamia is another striking feature of the disease in young children. Cough is apt to be quite infrequent or even absent, a condition due to diminished sensibility of the bronchial mucosa, and a symptom of bad omen. Stagnation of bronchial secretion thus acts mechanically in diminishing the respiratory area, and also favors resorption of toxins and consequent increase of the general intoxication. A third characteristic is extreme slowness of evolution of the usual stages of the bronchopulmonary disease. Secretion is long delayed, and remains thread-like, adherent, albuminous, and difficult to bring up for an unusual length of time. In treatment he deprecates all use of emetics and antimonials, which only add to the general depression, and, from diminished reflex excitability, are required in unusual dose to produce vomiting. On the contrary, strong stimulation and excitation of bronchial irritability are to be secured early. [In addition to the author's valuable observations, we may be permitted to emphasize the serious nature of the initial depression at the onset. The depression of the heart is most marked, and calls for strong stimulation with such drugs as alcohol, digitalis, and caffeine, which should be pushed for their effect during the first two or three days. If this initial stage of depression be successfully combated, the subsequent prognosis is much more encouraging.]

Mumps.—Marfan² has made a valuable compilation of recent writings on mumps in a formal paper on the subject, thus bringing our knowledge of the disease up to date. Pailhas³ has had occasion to observe, in an epidemic of mumps running through a boarding-school for girls, several irregular manifestations and some rather rare complications. Some of the patients presented a membranous angina in addition to the mumps, while two of the younger children, six and seven years old, were affected with marked laryngeal stenosis. Endocarditis of the mitral valve occurred in one patient—a complication which Jaccoud mentioned in 1884. What might be called an inverted type was shown by one case, the onset of which was marked by

¹ *Revue mens. des Mal. de l'Enfance*, March, 1895.

² *Ibid.*, Aug. and Sept., 1894.

³ *La Médecine infantile*, June 15, 1895.

periarticular swellings of the ankles, giving metastasis to the submaxillary glands, and leaving these in a few days to attack the right knee. A strange phenomenon in another case was the sudden appearance of numerous varioliform vesicles, associated with a dry cough and abdominal distention, these giving way in two weeks to a typical explosion of mumps.

Pertussis.—Silbermann¹ calls attention to the danger of dilatation of the right heart in severe cases of pertussis, a point strongly insisted upon several years ago by Koplik. There is first a venous stasis from the inflammation of the finer tubes and bronchopneumonic foci, with overloading of the right heart and the general venous system. Stasis alone, however, could not produce dilatation of the right ventricle; it requires the cooperation of the forced, prolonged, apneic expirations of the kink. One of his cases came to autopsy, death resulting from bronchopneumonia. The walls of the right heart were found to be thinned and its cavities considerably dilated; the myocardium, the orifices, and even the valves, were anatomically normal; the tricuspid valve alone was mechanically insufficient by reason of the dilatation of the right ventricle. The paper thus emphasizes the necessity of watching the heart during the whole course of the disease, and of supporting its strength by the early administration of digitalis as soon as signs of venous engorgement become noticeable.

Subcutaneous injection of quinin bimuriate has recently been proposed by Laubinger² as an efficient means of administering this drug in whooping-cough when it cannot be given in sufficient dose by the mouth. This salt is quite soluble in water, and, provided the solution be aseptic, can be injected beneath the skin repeatedly without producing abscess. Several solutions were employed, representing to each gram a dose of 5, 3, or $2\frac{1}{2}$ cgm. Injections were given as slowly as possible beneath the skin of the back, one or two, very rarely three, daily. In all of 12 cases, except 1, a decided decrease in the number of paroxysms was noted from the beginning of the injections. In this exceptional case the number of daily paroxysms increased from 20 to 25, and remained above the initial figure for six days, when a decided fall began and was maintained till cure resulted on the thirty-first day after injection was begun. In 4 of the cases, after the first decrease, on the fourth or fifth day an increase occurred, the paroxysms reaching a higher figure than at the beginning of the injections; but this was not long maintained, and was followed by a decided fall within a week. In these 4 cases, during the period of aggravation in the number of paroxysms the severity of the kink was not influenced, but in all the other cases decided modification in the severity of the attack as well as decrease in the frequency was observed. In all the cases, however, vomiting became less frequent, appetite increased, and the general condition improved. As regards the duration of the disease after beginning injections, in only 1 case was this remarkably short—ten days after beginning of treatment, and about

¹ Archiv f. Kinderheilk., Bd. xviii. S. 24.

² Jahrbuch f. Kinderheilk., Bd. xxxix. S. 141.

fifteen days after the onset of the convulsive stage in a case of rather moderate severity (18 paroxysms on the first day). In the other cases injections were required for twenty days (2), twenty-four days, twenty-eight days, thirty days, thirty-three days, and forty-five days (complicated by bronchitis). In the 4 remaining cases (those showing increase after the initial fall) the treatment could not be continued for various unessential reasons, and the injections were discontinued on the fifteenth to the twenty-second day.

One of the newest remedies for this disease is antispasmin, which was brought to notice by Demme and has lately been recommended by Fröhwald.¹ It is a combination of 1 molecule of narcein-natrium with 3 molecules of sodium salicylate; it is a slightly hygroscopic powder, readily soluble in water. According to Demme's observations, this drug is an excellent hypnotic and sedative in painful and convulsive states. Fröhwald has used it in more than 200 cases, and states that in most instances its use has been quickly followed by a decided lessening in the intensity and frequency of the paroxysms, and sometimes also in the duration of the disease. He has used the drug in a 5 or 10 per cent. solution with dilute water of bitter almonds, administered in a tablespoonful of sugar-water, or in milk or cacao, or for older children on crushed sugar. The 5 per cent. solution, three or four times daily, is used for children under three years of age in doses varying from 3 to 5 drops under six months to 15 to 20 drops at three years. The 10 per cent. solution is used for older children, with a beginning dose of 10 drops *t. i. d.*, to be increased to four times daily and to 15 drops; 20 to 25 drops may be given to older children or adults.

Excepting antispasmin, little that is new in treatment has appeared during the year, the older drugs still coming in for some share of notice. Antipyrin is praised by Cumston,² while Chapin and Lyndon³ speak highly of bromid of potassium. Bromoform receives some measure of approval from a few writers, such as Carpenter⁴ and Burton-Fanning,⁵ though Hollopeter⁶ is disappointed in it. In regard to the administration of bromoform some caution must be used, lest a larger dose than intended be given. This danger is illustrated by cases reported by Guntermann,⁷ in which a mixture of 5ij of bromoform with 3iv of syrup of tolu was used. The bottle had not been shaken, and as a result nearly pure bromoform had been given in the last doses taken. The children were aged five, three, and one and one-half years, and had received, according to directions, respectively 60, 30, and 10 drops of the more or less concentrated dregs. They all became narcotized, but pulse, respiration, and pupils remained normal, and all recovered. The best way to administer the drug is by dropping upon sugar or into water, or in combination with alcohol, as suggested by Carpenter:

¹ Archiv f. Kinderheilk., Bd. xviii. S. 38.

² Ann. of Gyn. and Ped., Nov., 1894.

³ Brit. Med. Jour., Aug. 25, 1894.

⁴ Philadelphia Polyclinic, June 16, 1894.

⁵ Brit. Med. Jour., Aug. 25, 1894.

⁶ Therapeutic Gazette, Oct., 1894.

⁷ Arch. of Ped., July, 1894.

R. Bromoform,	℥xlviij ;
Alcohol,	fʒiv ;
Comp. tincture of cardamom, q. s. ad	fʒiij.—M.

Sig. A fluidrachm three times a day in water.

Tuberculosis.—Cumston¹ reports a case of profuse hemoptysis in a child of sixteen months in support of the statements of Rilliet and Barthez and of J. Lewis Smith that pulmonary hemorrhage is hardly ever present in children, except when there is advanced tuberculosis of the bronchial glands. His experience also confirms the opinion of the French observers that pneumothorax is more frequent under the age of five than above this age.

Carr² draws some important conclusions concerning the starting-points of tuberculous disease in children, founded upon the records of 120 necropsies made at the Victoria Hospital, Chelsea, upon children suffering from tuberculous lesions, in no less than 82 of which the disease was more or less generalized. The most important general conclusions are these: 1. That tuberculous disease in children commences usually in the glands, the liability being at its maximum during infancy and early childhood, and rapidly decreasing in later childhood; that caseous glands, especially the internal ones, may (a) remain quiescent for an indefinite period; (b) start tuberculous mischief in adjacent parts, especially the lungs, by direct extension; and (c) set up general miliary tuberculosis. 2. That the internal glands, at any rate, are probably most often affected directly from the organ with which they are connected, although the possibility of infection through the blood-stream must not be forgotten. 3. That tuberculous disease starts much more frequently in the thorax than in the abdomen, and certainly far more often in the thoracic than in the mesenteric glands. No doubt is thus thrown upon milk as a possible source of tuberculous disease, but this does not seem to be by any means a frequent mode of infection as compared with that through the lungs. At the same time, the importance attached by Dr. Woodhead, on the basis of his statistics, to the mesenteric glands indicates the necessity of a further and prolonged investigation of the pathologic evidence, not in one place only, but in all parts of the country, for the conditions producing tuberculous disease may vary materially in different localities. 4. That glandular disease may often exist alone and quite unsuspected; in very many cases, doubtless, it is quite impossible of diagnosis. 5. But, after all, by far the most important treatment is the prophylactic. Whether the glands become infected directly through the lymphatic channels or indirectly through the blood-stream, the organisms must in every case have passed in through the mucous membrane, and through a healthy one they probably cannot penetrate. We have, therefore, to try to prevent gastrointestinal and respiratory catarrhs, and especially to avoid their becoming chronic; to deal promptly with, and if possible to prevent, rickets, the great cause of such catarrhs in early childhood; and to take

¹ Boston Med. and Surg. Jour., Aug. 23, 1894.

² Lancet, May 12, 1894.

especial care of children during convalescence from measles, whooping cough, and other acute specific diseases, so liable to depress the vitality of the body generally and the resistant power of the mucous membranes, as well as the filtering power of the glands in particular.

The value of indicanuria as a sign of tuberculosis in childhood, as advanced by Hochsinger in 1890, is still a question that demands further study. Kahane, and later Mlle. Djouritch, have published studies confirming Hochsinger's conclusions, while contrary results have been reached by Steffen, Voûte, and Carlo Giarre. Fahm's¹ investigations, while seeming to prove that indicanuria is more frequent in tuberculosis than in other diseases, rather add to the evidence against it as a diagnostic sign. During the year past two studies have appeared, one by Cima,² the other by Gehlig.³ Cima's cases numbered 68 children, most of whom were fed simply on bread and milk, some on bouillon, vegetables, and eggs, and others on mother's or cow's milk. 1. Cases of clinically declared tuberculosis of abdominal or thoracic organs—10 cases. Almost all had some irregularity of digestion, and the stools were mostly liquid or semifluid. In 99 analyses 69, or 69.69 per cent., gave positive reactions, while medium or very marked reactions were given in nearly half, 45.5 per cent. In these same cases very marked reactions were obtained after some days of feeding upon a diet richer in albuminoids, or during constipation. On the other hand, the reaction was slight or feeble when the children were put upon milk or had liquid or semifluid stools. 2. Cases suspected of tuberculosis, with adenopathy, chronic catarrh of intestines, or intermittent catarrh of bronchi—23 cases. In 75.34 per cent. positive reactions, or 46.57 per cent. of medium or marked reactions. 3. Cases of divers acute and chronic diseases—35 cases. Thirty per cent. of medium or marked reactions were given for the most part by children over two years of age on a mixed diet. The conclusion from these results is that the indican-reaction is more positively connected with anomalies of digestion, especially in mixed feeding, than with the principal malady; consequently indican has no other diagnostic importance than that of indicating the degree of decomposition of albuminoid substances in the intestines. Gehlig⁴ also comes to essentially the same conclusion, and believes that between indicanuria and tuberculosis there is no relation of sufficient constancy to give value to Hochsinger's sign.

Erysipelas.—Fasano⁵ records a rare example of erysipelas of the larynx in a boy of ten years. He had been ill only a few hours when first seen, having high fever, difficulty of deglutition, and marked dyspnea, which was rapidly increasing. The sister was convalescing from an attack of facial erysipelas in the adjoining room. A laryngoscopic examination detected an

¹ Jahrbuch f. Kinderheilk., Bd. xxxvii. S. 176.

² Trans. Internat. Cong. of Rome, 1894.

³ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 285.

⁴ Loc. cit.

⁵ Jour. Laryng., Rhin., and Otol., 1894, viii. 387.

enormous tumefaction of the epiglottis and ary-epiglottic folds, of a bright-red color, together with general congestion. Toward evening it became necessary to perform intubation; on the fifth day distinct improvement was noted, and on the tenth day the child was completely convalescent.

For erysipelas Tordeus¹ applies locally compresses saturated with a solution of mercuric bichlorid in spirits of camphor (1:20,000). Internally a solution of antifebrin and resorcin is given three or four times a day, in doses of as many c gm. of the former as the child is years old, and of the latter in twice this amount.

Mynter² reports a remarkable case bearing out the value of the erysipelas-toxins in the treatment of otherwise inoperable malignant growths. The patient was a girl of twelve years. Exploratory celiotomy revealed a large inoperable growth involving the parietal peritoneum, mesentery, pelvic organs, and cecum. A portion was removed for examination and proved the growth to be sarcomatous. Injections of toxins of erysipelas were begun four days later, gr. j being injected over the upper end of the femur. During the next week large masses of necrotic tissue were discharged through the abdominal wound, the patient began to improve, the tumor to recede, and the abdomen to become smaller. Improvement continued steadily, and two months after beginning treatment there was no trace of tumor and the child was in excellent health.

Miscellaneous Infections.—Bond³ records 2 cases of *multiple infection* of mucous membranes in the new-born which he attributed to suppurating existing in old lacerations of the mother's cervix. The importance of searching for such foci in the parturient canal is therefore strongly urged when the cause of such infection in the child is not clearly demonstrable.

Since Pfeiffer's first publication on *Glandular Fever* (Drüsenfieber)⁴ few papers on the subject have appeared, Heubner, von Starek, Rauchfuss, and Protassow being the only observers who have written thereon. Hoerschelmann⁵ reports a series of 16 cases of disease in which fever and swelling and tenderness of the cervical lymph-glands were the constant symptoms. Beyond headache, nausea or vomiting, and slight constipation, the mildest cases showed nothing further and lasted from a few hours to several days. A second group, of longer duration, presented a somewhat remittent type of fever, the temperature rising again as other glands became affected. Only 1 case showing much more severe symptoms and a protracted course is included. While other possible infections seem to be satisfactorily excluded, influenza, in some of the cases at least, does not seem to be altogether disproved, and the absence of bacteriologic control adds an element of incompleteness, if nothing else.

Under the term "*pseudo-diphtheritis of septicemic origin*" Epstein⁶ records a case of pseudomembranous stomatitis in a child three weeks old

¹ Therapeutische Blätter, July, 1894.

³ Virginia Med. Monthly, Feb., 1895.

⁵ Ibid., Bd. xxxviii. S. 14.

² Med. Rec., 1895, xlvii. 167.

⁴ Jahrbuch f. Kinderheilk., Bd. xxix. S. 257.

⁶ Ibid., Bd. xxxix. S. 120.

as the final stage of a septic gastroenteritis. The case corresponds closely with the series of cases reported by this author in 1879.¹ The day before



FIG. 1.—Septicemic pseudomembranous stomatitis (Epstein: *Jahrbuch für Kinderheilkunde*, Bd. xxxix, Heft 4).

death the uvula and half-arches were covered with a glazed grayish membrane, closely adherent, and the mucous membrane above and below the left ramus of the lower jaw was swollen and infiltrated (Fig. 1). Stenosis of the glottis from extension of the membrane was observed a few hours before death. Cultures of the blood previous to the appearance of the membrane had shown the presence of streptococci, and subsequently the membrane was found to contain a streptococcus identical in morphologic and biologic character with those in the blood, also the staphylococcus pyogenes aureus and albus and long rod-bacilli. The Loeffler bacillus was not present. It is thus evident that the throat-affection was secondary to the septicemia, and due to the septic cocci previously noted in the blood. The author believes that many of the forms of so-called secondary diphtheria in the course of variola, typhus, cholera, measles, and scarlatina are of this character.

GENERAL NON-INFECTIOUS DISEASES.

Rickets.—Wachsmuth² finishes an elaborate paper on the theory of rachitis by stating that the conditions for the precipitation of lime-salts in normal growing bone are (a) the presence of fully-developed cartilage-cells, and (b) the presence of carbon dioxid in the tissue of the cartilage and bone in quantity not sufficient to hold the lime-salts in solution or redissolve them when precipitated. In rachitis both of these conditions are incom-

¹ *Archiv f. Kinderheilk.*, Bd. i.

² *Jahrb. f. Kinderheilk.*, Bd. xxxix, S. 56.

pletely fulfilled, and in inverse proportion to the gravity of the disease, there being an abnormal development of the small-cell elements of the cartilage, with scarcity of the fully-developed cell, while at the same time the free CO_2 of the blood is increased and its diffusion rendered more difficult. In other words, rachitis is a chronic carbon-dioxid intoxication—an asphyxia of the growing bone.

Several years ago Lichtenstein¹ published the results of experiments upon the taste-perceptions of rachitic and nonrachitic children, in which he concluded that rickets produced a diminution or complete abrogation of the sense of taste, which was due to central disturbance. Büssem² has repeated these experiments upon a much larger number of subjects. One hundred and ninety-five children were examined, of which 105 were rachitic. Of the latter, 87 showed normal taste-sensation, 12 diminished sensibility, and only 6 complete absence of taste. Of the 90 nonrachitic children, 77 had normal, 10 diminished, and 3 negative reaction to the tests. The proportion of abnormal taste-sensation in the two classes of cases, according to the author, was therefore about equal (14 per cent. nonrachitic, and 17 per cent. rachitic). Lichtenstein's 49 nonrachitic children, excepting 2 idiots and an imbecile, reacted normally; while of his 38 rachitic subjects, 68 per cent., showed diminished or absent sense of taste. The results of these two studies are so at variance that no definite conclusions can be at present reached. A priori, the weight of probability, however, remains with the more recent investigator.

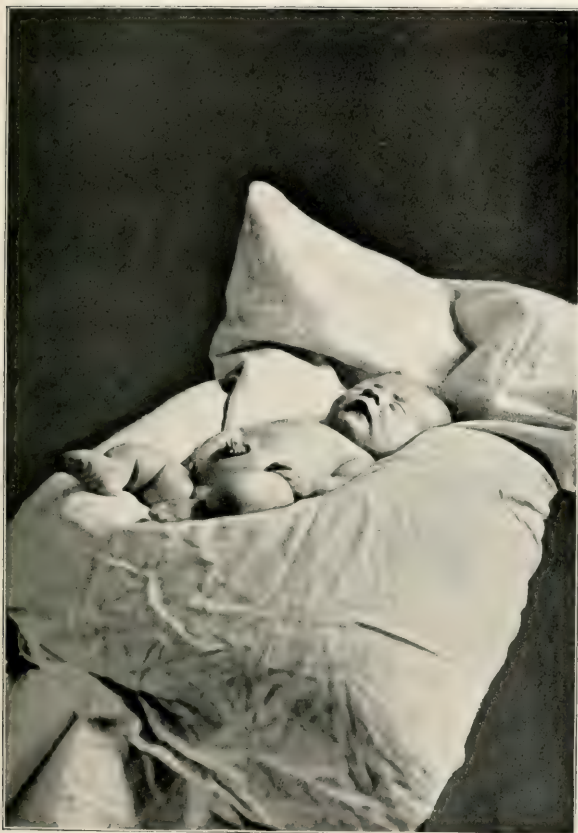
Under the head of congenital rickets a few cases have been reported during the year, notably those of R. Osgood Mason³ and Chas. W. Townsend.⁴ Mason's case, which was seen in consultation by Dr. Dillon Brown, was a female who lived three and a half days, its estimated weight being 6 pounds. Ten minutes after birth its head presented a square appearance, flattened on top and bulging at the sides. After death practically no parietal bones were found. The distance between the sides of the head was $4\frac{3}{4}$ inches; the whole of this wide space was without any symmetrical bony development, being partly occupied by several small, thin Wormian bones. The frontal bones were but partially developed, leaving a wide space even down to the nasal bones; the temporal, occipital, and facial bones were apparently fully formed. The clavicles were deficient in thickness; in the left one the continuity was entirely broken in the middle; epiphyses of ribs were enlarged; humeri were curved, with convexity inward, the left bone being broken. The pelvis was under size, the femora were curved and the ends enlarged. In the left bone only a slight cartilaginous connection existed in the middle portion. The tibiae were sharply curved. There was also marked exophthalmos, rapid panting, breathing, and general dusky color. The parents were unusual specimens of health and vigor. A severe fright to the mother in the third month of pregnancy is suggested as a possible cause. Townsend's case was a male, born at the

¹ *Jahrb. f. Kinderheilk.*, Bd. xxxvii. Heft 1.

² *Ibid.*, Bd. xxxix. S. 166.

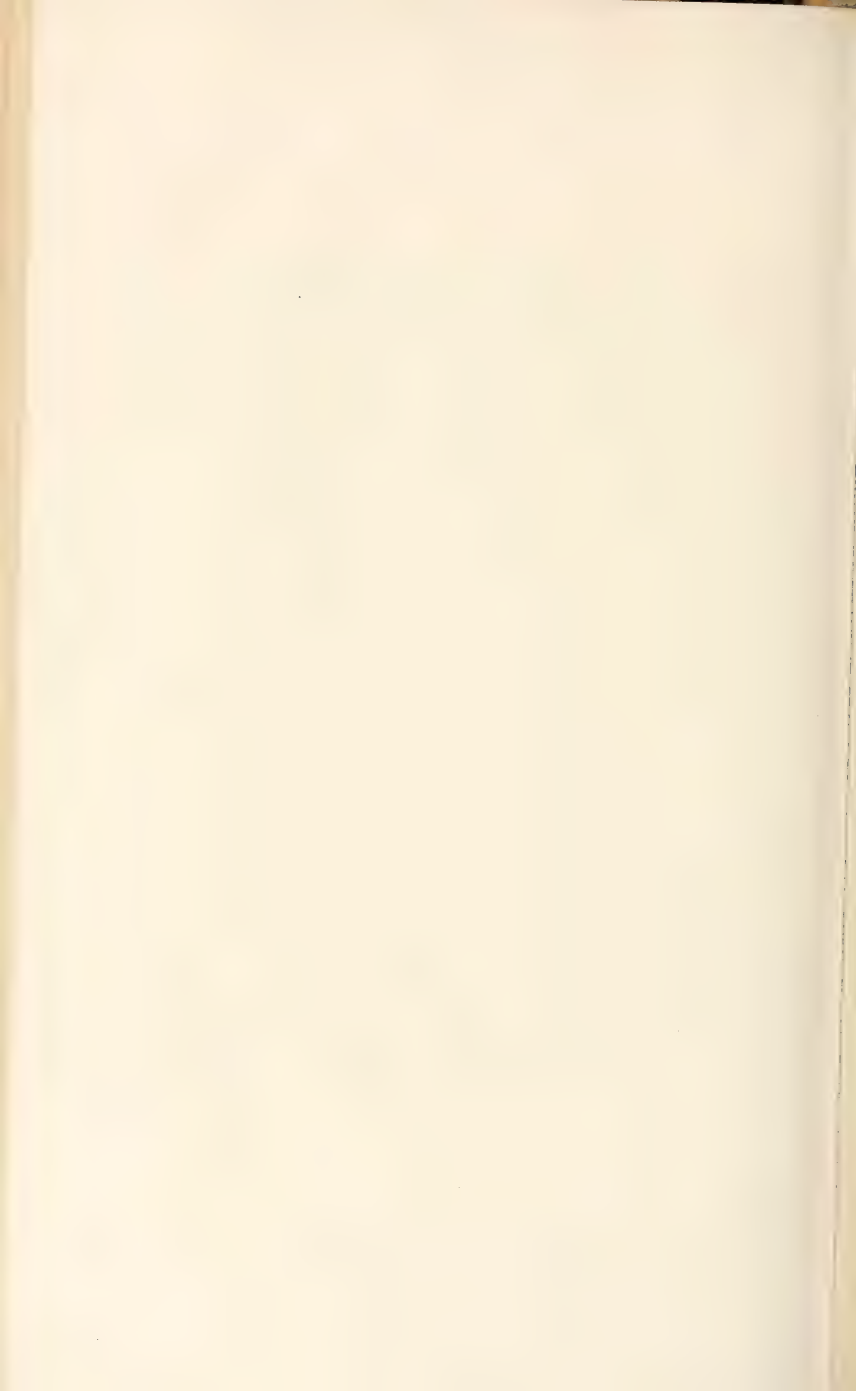
³ *Archives of Pediatrics*, September, 1894.

⁴ *Ibid.*, Oct., 1894.



Case of Congenital Rickets.

(From photograph furnished for this work by Dr. R. Osgood Mason of New York.)



eighth month, of young, healthy, well-formed parents. The head was shaped much like Mason's case, and contained many Wormian bones. The chest was ill-shapen, beaded, and small. The extremities showed marked evidences of rachitis; enlargement of epiphyses; curvatures of all the long bones, and numerous fractures; complete fractures of both tibiae, the left humerus, and both bones of right forearm. The child was always cyanotic, and died on the eighth day.

The frequency of rickets among Neapolitan children in America is ascribed by Snow¹ to the sudden change in environment produced by transition from the warm, sunshiny atmosphere of Southern Italy to the more changeable and inclement weather of most of the large American cities. While the ordinary unhygienic causes of rachitis are operative upon the children of all nationalities of immigrants, this seems to be the only possible explanation of the fact that in Buffalo, at least, rickets is six times as prevalent among the Italian children as among those of any other foreign race in America. Among the negro population rickets is almost a constant, if it might not be termed natural, episode of early life, but its peculiarities among this race has received scarcely any consideration in medical literature. Geo. A. Acker of Washington, D. C.,² has studied this aspect of the subject. One of the most active factors in producing this disease in the negro, outside of the ordinary hygienic and dietetic causes, is heredity—syphilis and tuberculosis in the parents being a common history. His experience with rickets among the blacks tends to disprove Eustace Smith's assertion that this disease is rarely engrafted upon a tubercular or syphilitic diathesis. In the negro he has found enlargement of the wrist-joints and deformities of the long bones, especially of the tibiae, much more pronounced than in the whites—an observation that will certainly be confirmed by many, even casual, observers in the streets of a large city. Softening of the ribs comes on early and is constant. The rachitic rosary is well pronounced, and the thoracic grooving marked in all cases. The liver of the negro is said to be larger than that of the white, and consequently the large belly is a more prominent feature. Pigeon-breast occurs in the majority of cases. Cranio-tabes he believes is rare in this race. Head-sweating is quite marked as an early symptom, doubtless due to the greater number of cutaneous sweat-glands in the negro. Nervous affections are rare in the negro race, and thus laryngismus stridulus is uncommon, the author having seen but 1 case in a negro rachitic subject.

Kassowitz³ thus summarizes his reasons for opposing Comby's conclusion that the convulsive phenomena of rachitis are due to the digestive disturbances which constantly precede or accompany this affection: 1. Observation shows that among breast-fed children, with normal digestion and good nutrition, rickets may be encountered, as shown by the condition of the cranial bones, of the fontanelles, sutures, and chondrocostal articulation. 2.

¹ Med. News, Sept. 22, 1894.

² Archives of Pediatrics, Dec., 1894.

³ La Pediatria, Sept. 20, 1894.

Children who suffer from grave dyspepsia and are cachectic or athreptic often have a normal skeleton, and in these cases present neither laryngospasm nor general convulsions. 3. Rachitic alterations of the skeleton are observed very often and manifestly immediately after birth; in these cases rachitis cannot be attributed to gastrointestinal autointoxication. 4. The frequency of rachitis increases during winter and spring and diminishes during summer, to attain a minimum in autumn. But digestive disturbances are frequent during summer and rare in winter.

Laryngospasm he therefore attributes to rachitic alteration of the bones of the cranium, which he believes to be of an hyperemic or inflammatory nature. This view, he thinks, is strengthened by the recent discovery of two centers in the cortex, faradic excitation of one of which produces occlusion of the glottis (Semon and Horsley, Krause), and of the other an arrest of respiration in expiration (Unverricht, Preobrachensky). To Comby's further contention that spasm of the glottis and other convulsive phenomena (clampsia, tetany, spasmodic nutans) are observed in rachitic infants without craniotabes, Kassowitz replies that, while he has found but a small number of children with laryngospasm who do not show craniotabes, softening of the bones of the skull is not the only sign, though it is the most frequent and most marked, of cranial rachitism. Characteristic deformity of the cranium and delayed closure of the fontanelle, either one or both, are observable in all children affected with laryngospasm without craniotabes, and here the abnormal excitability of the cortical centers of the brain is associated with an inflammatory hyperemia of the bones of the rachitic skull. The therapeutic effect of phosphorus upon both the bone lesions and the nervous symptoms of the disease is also adduced as an additional argument in behalf of Kassowitz's theory.

A somewhat different view of laryngospasm is held by Escherich,¹ who has observed this symptom almost constantly in association with Trousseau's sign, the facialis-phenomenon, increased electrical and mechanical excitability of the nerves and muscles, and even in some cases tonic contractures of the extremities—symptoms presenting a characteristic picture of tetany. This complex of symptoms suggests an acute functional neurosis, characterized by great hyperexcitability of peripheral nerves and muscles, and closely resembling the form of idiopathic tetany of adults described by Von Jaksch. Laryngospasm is the only symptom observed in the former which is not pictured in the adult disease, though in children over three years showing all the other symptoms laryngismus is frequently wanting; and, on the other hand, it has been observed occasionally in tetany of the adult. In 200 cases² exhibiting laryngospasm, observed by Escherich, only 1 or 2, he states, showed no symptom of tetany. While the greater proportion of such cases are rachitic, it is not the most severely affected who have laryngospasm nor those who

¹ Abst. in *Revue mens. des Maladies de l'Enfance*, Dec., 1894, from *La Pédatrie*.

² Marfan remarks the contrast of these figures with the exceeding rarity of tetany and laryngospasm at l'Hôpital des Enfants-Malades de Paris.

have very marked craniotabes. He therefore believes that, while rickets is an important predisposing cause of tetany, laryngospasm should be regarded as an autonymous, intercurrent disease, but observed most frequently in rachitic subjects. Von Ranke¹ also states that he has seen a number of cases of laryngospasm without Trousseau's sign or the facialis-phenomenon. In one case of early hydrocephalus that he observed before noticeable changes in the skull had occurred, laryngospastic attacks were present.

Willard² briefly epitomizes the treatment of rachitic deformities so satisfactorily that we may quote his words in concluding the subject: "Simple out-bowing of the legs before the bones are solidified is easily corrected by pressure from a properly applied apparatus. Long out-bowing accompanied by out-knee can also be overcome by mechanical measures. Forceful straightening over a solid fulcrum is often desirable, even if simple or green-stick fracture is produced, in a few cases when the parents cannot or will not attend to the adjustment of apparatus. Osteotomy is sometimes required in extreme cases of out-bowing in large children and in adults. In anterior curvature it is rarely advisable to employ apparatus. Manual fracture over a hard fulcrum, or osteoclasia, or preferably osteotomy, is advisable. Cuneiform osteotomy is seldom necessary, except in extreme cases, as even a wide intervening gap can be filled up by callus, and the simple operation is less liable to be followed by suppuration. For out-knee or in-knee osteoclasia is not desirable, but osteotomy above the condyle of the femur is safe, effective, and speedy. A secondary operation below the tibial tubercle is rarely required. Curvature of the femur, unless greatly interfering with locomotion, does not require operation.

Infantile Scurvy.—Infantile scurvy continues to occupy attention, especially among American observers, and the list of recorded cases is rapidly increasing since the discussion over Northrup's paper read before the New York Academy of Medicine in February, 1894, when 106 cases were reported. Northrup, in conjunction with Crandall, covered the same ground in a second paper,³ in which an analytical table of 26 American cases is given. Later cases are reported by Eagan,⁴ Fruitnight,⁵ Carr,⁶ Wise,⁷ and Blackader, Connell, Cameron, Morrow, and Orr of Montreal.⁸ Taylor⁹ details a typical case in which some of the symptoms of Pott's disease were so closely simulated that the child was sent to him for orthopedic treatment. Thomas Barlow of London elaborately reviews our present knowledge of the disease in his Bradshaw lecture,¹⁰ and there answers quite satisfactorily, to the majority of observers at least, any possible objections to the views held by Dr. Cheadle and himself. This paper may be referred to as a model presentation of the subject. It is a matter of surprise that

¹ *Jahrb. f. Kinderheilk.*, Bd. xxxix. S. 374.

³ *N. Y. Med. Jour.*, May 26, 1894.

⁵ *Arch. of Ped.*, July and Aug., 1894.

⁷ *Ibid.*, March 23, 1895.

⁹ *Arch. of Ped.*, Sept., 1894.

² *Arch. of Ped.*, Oct., 1894.

⁴ *Jour. Am. Med. Assoc.*, Feb. 9, 1895.

⁶ *Med. Rec.*, June 30, 1894.

⁸ *Montreal Med. Jour.*, xxxiii. 9, 1895.

¹⁰ *Brit. Med. Jour.*, Nov. 10, 1894.

Ashby of Manchester¹ puts himself upon record as a skeptic. He has seen over 30 cases in the past few years, but has the details of only 25, all of which had well-marked rickets. In 8 of these cases pancreatized fresh milk had been used exclusively or very largely; in 4, fresh milk with some farinaceous food; in 3, fresh milk and barley-water, or cream and rusks, or cream or milk with a well-known malted food; in 1, sterilized milk of a well-known dairy company, and also some fresh meat-juice; and finally, in 1 case, that of a boy of seventeen months with well-marked rickets and hemorrhages, the diet had been "rusks, corn flour, bread and milk, potatoes, beef-tea, milk-puddings, and bread and butter." Upon these data he refuses to recognize the scorbutic nature of the condition, because such cases had not been deprived of fresh food. He acknowledges, however, the strong suggestiveness of the usually prompt recovery after the children had been placed upon antiscorbutic treatment, and we may presume that his cases still continued to need treatment for the rachitis after their more threatening complication had been relieved. In conclusion he thinks it would be wise to drop the word "scurvy" in connection with these cases, and speak of them as rickets with a hemorrhagic diathesis, after the German fashion. [It seems but necessary to call attention to the fact that in a certain proportion of the reported cases rickets has not been present;² and that to include under the term "hemorrhagic diathesis" a condition so readily and completely amenable to treatment would require a very important enlargement of the ordinary significance of the term—a liberty that Dr. Ashby thinks must be taken with "scurvy" if it is to be retained for such cases.] It may be added that the German observers are inclined to combat the scorbutic nature of this disease, which still holds with them its original title of Barlow's disease. Fürst,³ writing most recently, after a long, critical review of the literature still remains in doubt on this point, and in a yet later paper⁴ presents the arguments for and against the identity of this disease with scorbutus, inclining for his own part to the view that it should be considered a hemorrhagic form of rachitis. He deprecates Hirschprung's⁵ proposition to rename the affection "Moller's disease," rightly crediting Barlow as the first to give a complete pathologic and anatomic picture of the condition.

An important point to which attention has been recently drawn is that scurvy may occasionally follow the prolonged use of sterilized milk. This view was strongly urged at the time of the discussion of Northrup's paper before the New York Academy of Medicine by Louis Starr, who reported several cases which he attributed solely to the employment of sterilization,

¹ Practitioner, Dec., 1894.

² We have seen at least 15 cases in which there were no signs of rickets. Christopher (Archives of Pediatrics, Dec., 1894, p. 888, foot-note) also mentions a case, and Fürst (Archiv f. Kinderheilkunde, Bd. xviii. S. 50) gives a very complete history of a fatal case in which no rachitic lesions were found; other references in the literature are not wanting to prove the truth of this statement.

³ Archiv f. Kinderheilk., Bd. xviii. S. 50.

⁴ Berl. klin. Woch., May 6, 1895.

⁵ Sep. Abdruck aus d. Hospitals-Tidende, Copenhagen, 1894.

since the infants immediately began to thrive upon the same milk-mixtures when sterilization was discontinued. This point is discussed at greater length by Starr in a very recent paper.¹ Jacobi's experience also favored this view; and similar though less emphatic ground against the process is taken by Barlow² and Heubner. Recently a case has been reported by Von Starek³ of Kiel, in which an infant fed exclusively upon sterilized milk until the seventh month, and then receiving in addition a small quantity of Kufecke's kindermehl, and occasionally a little bouillon and yolk of egg, developed marked scurvy at the age of nine months. Buckingham⁴ also records a case of typical scurvy occurring in a child of nine months, where he found that the milk was regularly boiled in the sterilizer for two hours. Rogers has seen two marked cases following the use of sterilized milk, diluted, and artificially prepared foods. [The symptomatology of infantile scurvy is now too well known to require description, but we may be permitted to recall Barlow's brief summation of the characteristics of the disease: "1. Predominance of lower-limb-affection in which there is immobility going on to pseudoparalysis, excessive tenderness, general swelling of the lower limbs, skin shiny and tense, but seldom pitting, and not characterized by undue local heat; on subsidence, revealing a deep thickening of the shafts, also liability to fractures near the epiphysis. 2. Swelling of the gums about erupted teeth only, varying from definite sponginess down to a vanishing point of minute, transient ecchymosis." These constitute the chief diagnostic differentia between infantile scurvy and rickets properly so called. But to these must be added as the most important diagnostic point of all: "3. Definite and rapid amelioration by antiscorbutic regimen." The treatment, briefly, is fresh milk, fresh beef-juice, and orange-juice.]

Wallace Ord⁵ exhibited to the London Pathological Society an extensive subdural hemorrhage from a case of infantile scurvy. The clot occupied the whole vault of the cranium, but there was no sign of basal hemorrhage. The patient had been fed on a proprietary food from birth, and showed signs of rickets. No evidence of intracranial pressure during life had been observed, the child succumbing to an attack of acute bronchopneumonia.

Diabetes.—Cnopf⁶ records a rapidly fatal case of diabetes mellitus in an infant two years and nine months old. Actual symptoms of illness were observable only four days, and death occurred in coma twenty-four hours after diagnosis was confirmed. None of the usual causes of the disease could be recognized.

Infantile Myxedema.—Cretinism—or infantile myxedema, the term now suggested—still continues to attract attention because of the increasing number of cases being reported in confirmation of the earlier promises of thyroid-feeding in the treatment of this disease. Very encouraging

¹ Am. Jour. Med. Sci., Nov., 1895.

² Loc. cit.

³ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 375.

⁴ Boston Med. and Surg. Jour., Aug. 16, 1894.

⁵ Brit. Med. Jour., Dec. 22, 1894.

⁶ Münch. med. Woch., April 30, 1895.

results were recorded in 1894 by Bramwell,¹ Railton and Smith,² and Anson.³ Crary⁴ relates a case of a female child of five years, weighing at birth 8 pounds, and seemingly normal in every respect until six months old. It was then noticed that she had ceased to grow and was losing weight. At the age of five years she was no larger than a ten-months' infant. Symptoms of myxedema were very conspicuous. The disposition was good, but intelligence was slight, and her attention could not be attracted by ordinary sounds or bright light. She was ordered a glycerin extract of lambs' thyroids, gr. xxiv to the dram, with an initial dose of 1 drop t. i. d., to be cautiously increased. At the end of six weeks the child was much brighter mentally, and the edematous swelling of the face and body was greatly reduced. Northrup⁵ also records 2 examples of this condition, in patients of nine and twelve years, in which improvement was gained after three months' treatment with the thyroid extract. In commenting upon the thyroid-treatment in a case exhibited by Morris Manges before the New York Academy of Medicine, Crary⁶ stated that in his own cases the thyroid tabloids of Burroughs, Wellcome & Co. had been better tolerated by the gastrointestinal tract than some other preparations which had proved useful except for this drawback. He had also learned that in using these tabloids their effect on the pulse-rate was the best guide in treatment, whereas with the glycerin extract the treatment should be controlled by its effect on the temperature.

Osler⁷ records the further history and progress of one of the cases reported by him in 1893.⁸ In the interval between January, 1892, and March, 1893, when the child was three years and five months old, she had improved remarkably, the most striking changes being the disappearance in great part of the anemia and lessening of the firm subcutaneous edema. Treatment with thyroid extract was begun at this time, and at the end of fourteen months the change had been extraordinary, manifested, first, in the entire loss of the cretinoid aspect, the color being good and nutrition evidently much improved; second, she had begun to develop rapidly, and since the last measurement, fourteen months before, she had grown four inches in height; third, she walked and ran about everywhere; and fourth, the mental development had been proportionately striking. By far the most remarkable result that has come to notice is furnished by the case of J. P. West⁹ of Bel-laire, Ohio (Plate XIV.), portraits of which are reproduced by the kindness of the author and of the editor of the Archives, Dr. Crandall. At seventeen months the child presented the appearance shown in the first picture, and after six months' thyroid-treatment the results are shown in the second picture. The third portrait, taken July 5, 1895, after one year of treatment, shows a continuation of the satisfactory condition previously at-

¹ Brit. Med. Jour., Jan. 6, 1894.

² Lancet, April 28, 1894.

³ Arch. of Ped., Nov., 1894.

⁴ Ibid., Feb., 1895.

⁵ Ibid., March 3, 1894.

⁶ Am. Jour. Med. Sci., May, 1894.

⁷ Ibid., Dec., 1894.

⁸ Am. Jour. Med. Sci., Nov., 1893.

⁹ Arch. of Ped., May, 1894.



FIG. 1.—Stan R., seventeen months old, June 26, 1894.
Treatment commenced July 5, 1894.



FIG. 2.—Same child, twenty-three months old, January 8,
1895. Under treatment six months.



FIG. 3.—Same child, twenty-nine months old, July 5, 1895.
Under treatment one year.

tained. Sinkler¹ also records a case in which the symptoms began to develop at about six months of age. The child was first seen by the author at the age of three years and one month. After beginning thyroid-feeding, remarkable improvement, mentally and physically, was evident at the end of four months. One of the most striking changes, as has also been observed in other cases, was the improvement in the quality and quantity of the hair. As Sinkler says, "It is too short a time since the introduction of the thyroid-feeding in cretinism to form any opinion as to the final results; but since, in all the cases reported, remarkable changes have taken place, we have reason to rejoice in possessing a remedy which can accomplish so much as has already been done for these once worse than hopeless cases."

DISEASES OF THE DIGESTIVE ORGANS.

Nomenclature of Diseases of the Mouth.—At its meeting in 1894 the American Pediatric Society accepted the report of Drs. Rotch and Forchheimer, a special committee constituted to revise the nomenclature of diseases of the mouth. The generic term stomatitis was retained, and a general name provisionally adopted for the disease known as thrush, which, while unable to give a specific name, the committee could state was not due, as formerly supposed, to the *oidium albicans*. In tabulated form the classification is given as follows:

STOMATITIS.	Catarrhalis . . .	{ Simplex.	
		{ Exanthematica Secondary to the exanthemata.	
		{ Traumatica { Mechanical.	
	Herpetica	{ Thermal.	
		{ Chemical.	
	Ulcerosa	Aphthosa.	
		Scorbutus.	
		{ Arsenic.	
		{ Mineral poisons { Lead.	
		{ Mercury.	
	Mycetogenetica.	And other diseases.	
		{ Hyphomycetica Thrush.	
		{ Diphtheria.	
		{ Pseudomembranosa . . Tuberculosis.	
		{ Syphilis.	
	Gangrenosa	{ And like diseases.	
		{ Noma.	

Diseases of the Stomach.—In a critical review of Zuccarelli's thesis² Léon d'Astros draws an important conclusion touching the question of the relation of dilatation of the stomach and rachitis. He considers gastric ectasia as a possible, and even very frequent, though not necessary, consequence of chemic disturbances of digestion, which, in association with improper feeding, may produce rachitis; in other words, dilatation and rachitis are often parallel effects of the same cause.

¹ Internat. Med. Mag., Dec., 1894.

² L'estomac de l'enfant; considérations anatomiques. Dilatation stomacale, Paris, 1894.

Diseases of the Liver.—Surgeon-major J. B. Gibbons¹ of Calcutta describes the morbid anatomy and pathology of “a form of biliary cirrhosis” that occurs in children in India. It is essentially and primarily a disease of the liver-cells, which undergo irritation and degeneration. The development of fibrous tissue occurs just within the lobules, constituting an intercellular cirrhosis. At a later period the portal sheaths are affected and interlobular bands are produced. An important feature of the disease is the multiplication of bile-ducts, a process which begins early within the lobules among the cells; they were most numerous in those parts in which the liver-cells were destroyed. This proliferation, in the opinion of Paltauf and Kundrat, is connected with the reformation of the liver-tissue, and hence is a curative process. This feature, according to these two distinguished authorities, seems to show the possibility of regeneration of liver-tissue in the course of disease, an observation never before made, though a regenerative process has been proven in animals after experimental removal of a portion of liver-tissue, and in man after surgical interference for new growths in the otherwise normal tissue of the organ. The cause of the disease is probably an irritant generated in the stomach or intestines as the result of imperfect digestion or improper food.

Diseases of Gastrointestinal Tract.—Lesage and Thiercelin² publish a *bacteriologic study of acute gastrointestinal infections in infants*. According to their observation, the bacterium coli commune is the most common organism, and next in order are the tyrothrix and the bacillus pyocyaneus. Algidity is observed when the dose of the poison (toxin) is high, pyrexia, when less intense; both forms, however, they believe due to the same infective principle. They refer to the work already done in this line by Booker, who has isolated 19 different organisms in the diarrheic stools of infants, and to that of Baginsky, who, besides the colon-bacillus and the bacterium lactis aërogenes, has observed a white liquefying bacterium rapidly fatal to mice. Their own observations have shown only the three organisms mentioned, but they believe that the pyogenic organisms may favor antecedent digestive disturbances and play an important role in the complications observed in the course of acute intestinal infections. Further investigations are promised. Czerny and Moser³ detail the histories and bacteriologic examinations of the blood in cases of dyspepsia and of gastroenteritis in nurslings, and thus offer additional evidence that gastroenteritis is a generalized infection originating in the intestine and due to various microorganisms, among which they have found staphylococci, streptococci, the bacterium coli commune, bacillus pyocyaneus, and bacterium lactis aërogenes. In 12 out of 15 cases of gastroenteritis one or more of these varieties of organisms was found in the blood, while in all of 11 cases of dyspepsia cultures of the blood yielded negative results. Control experiments were made with the

¹ Reprint from Trans. Indian Medical Congress, Calcutta, 1894.

² Rev. mens. des Mal. de l'Enfance, Nov., 1894.

³ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 430.

blood of 30 apparently healthy children (60 cultures), with a negative result except in 1 instance, in which a nonpathogenic organism was found.

Para¹ reports 5 cases of *cholera infantum* treated successfully in accordance with the plan of Luton of Reims and Rémy of Nancy. He believes that by this method almost all children affected while in good health may be saved if seen by the physician sufficiently early. In the beginning all food is interdicted for a number of hours, according to the strength of the child and the intensity of the disease. Then, to answer the immediate indications, to calm thirst, cleanse the digestive tract of poisonous substances, to restore to the blood the liquid it has lost, and to reestablish normal blood-pressure, a feebly alkalized and sparkling water, like Vals or Soultzmatt, is given persistently. At first small doses are used, frequently repeated, as long as thirst is evident, until in a few hours a quarter, half, or even an entire liter may be taken. When the gastric intolerance is extreme the first doses are rejected, but this irritability soon subsides under persistent administration. The subsequent treatment, which is of extreme importance, is to be carried out by the usual cautious and graduated return to milk-feeding. For stomach-washing in cholera infantum Blech² speaks highly of hydrozone, which he uses in the strength of a tablespoonful to the pint of water. Two ounces to the quart are used for intestinal irrigation. Morphine and strychnin, hypodermatically, according to their indications, are the only drugs which he employs, in conjunction with the usual dietetic restrictions. [The plan seems well worth an extended trial.]

The propriety of *intestinal irrigation* in the treatment of diseases of children needs no defence at the present day, and, so far as morbid conditions of the large intestine are concerned, its use is fully appreciated. It has always been a question of more or less uncertainty, however, how far fluid thus introduced could be expected to pass the ileocecal valve and reach the small intestine. Experiments on this point as regarding children have been recently made by Ssokolow.³ In the bodies of 130 infants under one year of age he found that the valve was completely competent in only 27 cases (20.8 per cent.), while in 103 fluid passed freely into the ileum. In older children, ranging from one to twelve years, the proportion of the incompetency was not so high, since out of 70 cases the valve was not perfectly tight in 37, but in 33 was fully competent. In several cases it was found that water flowed easily without need of much distention of the cecum, while in other cases a stronger pressure was required. A pressure greater than that of an elevation of 3 meters is dangerous and liable to cause rupture of the intestine or disorganization of the valve. It therefore follows from these figures that in children under one year fluid may be expected to reach the small intestine in three-fourths of the cases, and in older children the chances are 1 in 2. Therefore in every suitable case an effort should be

¹ Rev. mens. des Mal. de l'Enfance, Sept., 1894.

² New York Med. Jour., March 2, 1895.

³ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 186.

made to reach the small intestine by the irrigating fluid. The tube should be inserted, if possible, up to the sigmoid flexure, and a pressure of not more than 1 to $1\frac{1}{2}$ meters should be employed. Besides the numerous morbid conditions that admit of treatment in this way, the possibility of intestinal feeding, rather than rectal, should not be overlooked in cases in which mouth-feeding is difficult or impossible, as in trismus, laryngeal diseases, dysphagia from disease of the esophagus, or in intrinsic diseases of the stomach where rest of that organ is demanded.

Marfan¹ comes to the conclusion that the large *flaccid belly* so often noticed in infancy in association with chronic gastrointestinal disturbance is due to an actual hypertrophic elongation of the intestine. In the new-born infant the small intestine is about five times the total length of the body, while the large is about equal to once the length, or together they measure about six times the body-length. During the first two months of life the combined length of the intestines increases rapidly, reaching seven or eight times the body-length. Measurements made by Marfan in 16 infants that had died after presenting this condition of flaccid belly showed that in every one of the cases the total length was from nine to twelve times that of the body.

Tubercular Peritonitis.—In 7 cases of tubercular peritonitis coming under his care, Marfan² reports satisfactory results from a purely medical treatment. This includes rest and suitable climatic conditions, nourishing diet, counterirritation, and medication. Under the latter head he gives the syrup iodotannique of the French Codex the chief place as an antitubercular remedy for children. Cod-liver oil, creosote or its derivatives, phosphates, or hypophosphites may be employed with advantage, as also arsenic within the limit of causing gastrointestinal derangement. For counterirritation he uses a coating of tincture of iodine applied to the abdominal parietes, covering this when dry with a coating of flexible collodion. This in a measure immobilizes the abdominal wall and the organs beneath, and diminishes by compression the hyperemia of the affected parts. These applications are to be renewed weekly or fortnightly. Celiotomy is applicable under the following conditions: 1. Fibrocascous peritonitis with ascites; 2. Localized peritonitis with encysted collection; and 3. Intestinal occlusion occurring in the course of a tubercular peritonitis. Even in these cases operation is contraindicated by the coexistence of other tubercular lesions in thoracic organs or in the intestines, when extensive and advanced. Chronic albuminuria he also regards as contraindicating operation.

Intestinal Parasites.—Schmitz³ speaks highly of naphthalin as a remedy against the oxyuris vermicularis, with which he has recently experimented according to the method of administration suggested by Ungar. The dose varies from $2\frac{1}{4}$ grains for a child one and a half years old to 6 grains for one of twelve or thirteen years. It is best given in powder mixed with sugar, or

¹ Rev. mens. des Mal. de l'Enfance, Feb., 1895. ² La Presse médicale, Aug. 18, 1894.

³ Jahr. f. Kinderheilk., Bd. xxxix. S. 121.

in capsule. After a good purge four doses are given daily for two days, repeated eight days after the first dose, and again repeated after an interval of fourteen days. In some cases a third repetition is made after eight to fourteen days, or the course is repeated after a somewhat longer interval. More satisfactory results will be obtained by combination with intestinal irrigation of a tablespoonful of liquor aluminii acetici to the liter of water, as used by Ungar.

Congenital Dilatation of the Colon.—Congenital hypertrophic dilatation of the colon forms the subject of a paper by Mya,¹ who adds 2 new cases to the 6 already reported by Hirschprung and Genersich,² making, with 1 case observed by Walker and Griffith in 1893, 9 cases of this affection at present recorded. The author with reason thinks that the condition is to be attributed to a vice of development, and not to fetal disease, citing a parallel in congenital dilatation of the stomach. Given this anatomic defect, the other phenomena rapidly follow: fecal stasis causing muscular hypertrophy, chronic interstitial enteritis, and ulceration. The secondary obliterating arteritis favors the denutrition of the walls, and renders the mucous membrane less able to protect itself against infection and intoxication. These cases suggest a possible explanation for the congenital chronic constipation of young children. Assuming that the cases herein considered are extreme ones, it is reasonable to suppose that the intermediate conditions between them and mild constipation correspond to anatomical alterations less marked—*i. e.* to a congenital ectasia of the colon of varying degree. It therefore follows that lavage of the intestine with a very long tube should be superior to laxatives or purgatives in the treatment of constipation in children.

New Growths.—Stern³ records an extremely rare case of primary sarcoma of the small intestine in a new-born baby dying four days after birth. The autopsy revealed a tumor of the small intestine situated 132 cm. from its beginning and occupying transversely 4 to 5 cm. of its lumen. This growth was a broad sessile tumor rising $1\frac{1}{2}$ cm. above the general surface of the mucosa, and involved all the coats except the peritoneal. It consisted of a very marked round-celled infiltration, with great overgrowth of the capillary vessels in the outermost zone, and corresponding closely to Kolaczek's picture of angiosarcoma. The growth was primary, and no metastases were found in the otherwise healthy body. Only 5 cases of primary sarcoma of the intestine in children under ten years have been hitherto reported.

THE BLOOD AND CIRCULATORY SYSTEM.

Pathology of the Blood.—Berggrün's⁴ studies of the fibrin of the blood of 40 sick and 30 healthy children, after the method of Alexander Schmidt, show that in the normal state the blood of the child is richer in fibrin than that of the adult. In states of diseases, such as pulmonary tuberculosis,

¹ Lo Sperimentale, 1894, fasc. iii. p. 215.

² Cf. Jahrb. f. Kinderheilk., Bd. xxxviii. S. 91.

³ Berl. klin. Woch., Aug. 27, 1894. ⁴ Archiv f. Kinderheilkunde, Bd. xviii. S. 178.

pulmonary inflammations, purulent pleurisy, and articular rheumatism, fibrin is greatly increased, while in amyloid disease a decrease may be encountered; in nephritis and slight anemia the fibrin value is about normal, but in severe anemia it is decreased, increasing only in the presence of fever. A contribution to the knowledge of the specific gravity of the blood in various diseased conditions of children is presented by S. Felsenthal and L. Bernhard.¹ Diphtheria produces generally an increase in gravity, which seems to correspond in a way with the degree of severity of the disease. In nephritis the density of the blood is decreased, but increases with the cure of the disease; hence its determination is of some value in prognosis. The hemoglobin is diminished, but not to the extent of the specific gravity, and the number of red globules is less reduced than either. In anemia and chlorosis the density is decreased, often very notably. In rachitis their results differed somewhat from those of Hock and Schlesinger, in that they found that in all cases of rachitis the specific gravity of the blood was below normal, even in those children apparently well nourished and healthy-looking—the florid type—cases in which Hock and Schlesinger found the gravity very nearly normal. Besides the loss in gravity all the cases showed oligochromemia, but normal or nearly normal count of red corpuscles, and distinct leukocytosis. In gastrointestinal affections of slight degree not accompanied by great loss of fluid the specific gravity of the blood remains normal; but in profuse diarrhea there is a thickening of the blood, which is shown by an increase in density, and this attains a maximum just before death. Progressive increase in density is therefore a bad sign. In the febrile state the researches have yielded contradictory results. Very much the same ground is covered in a later paper on this subject by Prof. Monti.² Of special significance he considers any disturbance of the parallelism between gravity and hemoglobin-value, which he has observed to be constant for the healthy individual. Most frequently the specific gravity remains normal, but the hemoglobin-value is deficient, as is most commonly seen in light grades of chlorosis. Therefore repeated examinations of the blood during treatment offer the best indication of the progress of the cure, for until the parallelism between specific gravity and hemoglobin-value is restored mere clinical appearances cannot be relied upon. The same conditions were found to obtain in the slight anemias of children, in chorea, and in tuberculosis. An increased gravity and a normal hemoglobin-value have been observed in the active stage of acute febrile diseases like pneumonia, pleurisy, etc.

Congenital Diseases of the Heart.—A valuable brochure of the year is *Congenital Affections of the Heart*, by George Carpenter of London,³ in which the subject is briefly but concisely considered. He endorses the view of Rauchfuss that fetal endocarditis is more common on the right side only when in association with developmental errors, and apart from such the left side is not less frequently involved. He also considers that it is often a nice

¹ *Archiv f. Kinderheilk.*, Bd. xvii. Heft 5 u. 6.

² *Ibid.*, Bd. xviii. S. 161.

³ London, John Bale & Sons, 1894.

point to decide whether in some cases a mitral stenosis is due to intrauterine or postnatal endocarditis. The chapters on symptomatology, physical signs, prognosis, and treatment are admirably done, and are well worthy of perusal.

Zariquiey¹ records a case of *congenital cyanosis* in which the evidences of fetal endocarditis were most clearly demonstrable. There was marked stenosis of the tricuspid orifice and occlusion of the orifice of the pulmonary artery from fusion of the valve-segments. Circulation was maintained for eleven months in consequence of the patency of the anterior third of the foramen ovale and continued perviousness of the ductus arteriosus.

Physical Examination of the Heart in Childhood.—The importance of an accurate knowledge of the normal percussion-dulness of the precordia in childhood cannot be overestimated, but little will be found in the text-books: Rotch, in Keating's *Cyclopedia*, is the only writer who gives the subject much attention. Whitney² therefore summarizes his observations on this point, gained from a study of a large number of children, as follows: In children up to the beginning of the sixth year the relative dulness of the normal heart has practically the same limits as in the adult. This is clearly outlined in his diagram here reproduced (shaded area). The lower half of

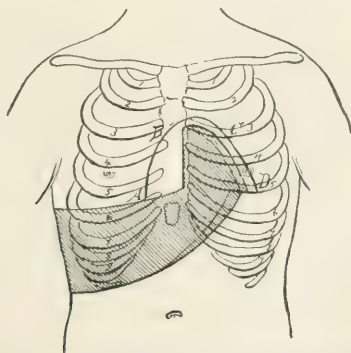


FIG. 2.—Diagram of precordial dulness in childhood (Whitney).

the sternum is therefore of the same resonance as the upper half in children under six years. From the fifth to the ninth year the precordial dulness varies. In a few, even at six years, some slight dulness will be found over the lower half of the sternum, and in other respects also the precordia appears to have begun to assume the characteristics presently to be described as peculiar to the latter half of childhood. A considerable majority, however, of children between five and nine have, according to his experience, a precordia which does not differ from that found in infancy and adult life. At

¹ *Revue mens. des Mal. de l'Enfance*, Nov., 1894.

² *Archives of Pediatrics*, Nov., 1894.

five years all cases presented what for convenience may be termed the infantile precordia. At six years there were two infantile to every one enlarged. At seven about an equal number of each; and at eight, 3 enlarged to every 2 infantile. At the age of nine the infantile precordia had entirely disappeared. It may be said, then, that, beginning with the age of six years, the infantile precordia begins to give place to the enlarged precordia of later childhood, and that this tendency gradually increases, until at nine years all cases are uniformly enlarged. During the period, therefore, from the fifth to the ninth year the diagnostic value of cardiac percussion *per se* must necessarily prove equivocal. In children over eight years and up to about the age of puberty the limits of the normal precordia are invariably found to differ widely from those of the first half of childhood and of adult life. In the first place, the upper border is generally higher. (See Fig. 2, *A, B, C, D.*) It is often found as high as the second interspace, and occasionally as high as the second rib. The apex is usually a little outside the mammary line, perhaps $\frac{1}{4}$ to $\frac{1}{2}$ inch. Of far greater significance and clinical importance is the position of the right border of precordial dulness. Instead of being a perpendicular along the left sternal border, it is now a curved line that meets the line of liver-dulness at a point outside the right sternal edge, and usually $1\frac{1}{4}$ to $1\frac{1}{2}$ inches to the right of the median line. This distance, of course, gradually diminishes as the upper boundary is approached. The precordia now has the form given in Weil's plate, and is somewhat similar to that found in pericardial effusion.

Functional Diseases of the Heart.—An important paper is contributed by Professor Heubner¹ on cardiac irregularity in childhood. After quoting the views held by various authorities, he excludes cases of arrhythmia due to tubercular meningitis and pronounced cardiac inflammations, and considers the phenomenon under eight different headings: 1. The simplest case is where irregularity is met with after poisoning. An instance is quoted of a child who had eaten stramonium-seeds. On the third day there was decided irregularity of the pulse, which disappeared on convalescence. Large doses of digitalis and opium have been noticed to produce the same effect. 2. Closely allied are cases of disturbed rhythm from digestive troubles. Recent investigation suggests in many severe forms of indigestion the circulation of some poison in the blood—a form of autointoxication. An example is given in a child six years old suffering from gastric disorder, who began to show cerebral symptoms, vomiting, etc. There was rise of temperature, very irregular intermitting pulse, retraction of the head, and drowsiness. It was regarded as a case of autointoxication, and this was confirmed by the favorable issue and the appearance of acetone in large amount in the urine. Another case showed under similar circumstances a slow, unequal heart-beat. 3. Cardiac irregularity may be met with in abdominal affections where no grounds exist for regarding it as due to poisoning. 4. In this most important group is considered the arrhythmia found in the course of infectious dis-

¹ Zeitschrift f. klin. Medicin, Bd. xxvi., Dec., 1894.

cases. It is divided by Heubner into two groups: 1, that coming on during the development and height of the disease; 2, that met with in convalescence. The first category is much more rare. Many authors mention it in typhoid fever, but Heubner has had no experience of it. Better known are those heart-disturbances which show themselves during the defervescence of an infectious disease. In diphtheria they are often present, and also not infrequently in scarlet fever, of which several instances are quoted. Measles and acute croupous pneumonia are often mentioned, and a case is given where the symptoms set in late in typhoid fever. 5. Some authorities mention the occurrence of irregularity in anemic and nervous, excitable children, and this is confirmed by the writer. He thinks it leads to a false diagnosis in many of these cases. It may be found in rachitic, weakly, pale children between two and four years of age, who are suspected of suffering from tubercle, and the suggestion of meningitis is only too readily accepted. 6. Intestinal parasites are said to cause cardiac irregularity, but the author has had no experience of it. 7. It occurs under certain physiological circumstances. Emotional states produce it; it has been noted during sleep, and occasionally it follows a warm bath with subsequent cooling. 8. Finally, there is said to be an idiopathic form, though Heubner has seen no example of it. DaCosta has described it as a disturbance of rhythm, which appears to form the entire disease; the children seem otherwise well. All the above causes could be excluded, and the most striking feature was that every febrile attack led to the disappearance of the irregularity. In discussing the mode of occurrence of the irregularity of the heart under these various conditions Heubner refers to nerve-influence a disturbance of the regulating nerves of the heart. This is the explanation in tubercular meningitis, increased pressure on the cranial vault affecting the centres in the medulla. Irritation of peripheral nerves—such as the splanchnic depressor, etc.—disturbs the rhythm, and would explain a continuation of such a symptom with nausea and vomiting. It is more difficult to explain when due to poison, although we can assume an action upon the nerve-centres or upon the muscle of the heart. Its onset in chronic cardiac diseases has been observed by Heubner only in the stage of insufficiency. The cause of its presence in anemic, rapidly-growing children is involved in great doubt, and the suggestion of a relatively small arterial system is founded on experimental evidence. The treatment of cardiac irregularity in children requires a careful consideration of the causes. If it is reflex, the irritation must be combated. Where poison is the cause, the stomach and intestines should be emptied, and copious draughts of water given to wash it out of the system. In the anemic form suitable diet and medicinal treatment are indicated. For the idiopathic variety DaCosta recommends moderate movement, limited gymnastics, frequent small meals, and sea-baths.

Diseases of the Pericardium.—The importance of adherent pericardium as a cause of hypertrophy of the heart in childhood—a fact noticed by Sanson several years ago—is brought to prominent notice by an able paper from

the pen of Theodore Fisher of Bristol.¹ According to this writer, adherent pericardium appears to be more common in children than ordinary valvular disease. The most important diagnostic sign, in his opinion, is a sound heard during diastole, which may constitute part of a typical *bruit de galop* or be a rumbling sound that might easily be mistaken for a presystolic bruit. In cases of adherent pericardium with dilated heart, whether there is disease of the mitral valve or not, there will almost certainly be a systolic apex-bruit due to regurgitation. In addition to this systolic bruit, there will also probably be heard another abnormal sound interpolated between the first and second sounds. This may be merely like a soft first or second sound, or it may be of rumbling character, diastolic or presystolic in time, and thus be thought to indicate mitral stenosis.

Two cases of suppurative pericarditis are recorded by Haushalter and Étienne.² The first occurred in a rachitic child of four years as a termination of a chronic bronchopneumonia. The pneumococcus of Fränkel was found in the pus. The second instance was observed in a child of eleven months in association with bronchitis, bronchopneumonia, and abscess of the right thigh. The pus of the pericardium, of the pleural exudate, and of the lungs themselves contained the pneumobacillus of Friedländer. In neither case was the pericardial suppuration discovered before death. A résumé of 17 collected cases of suppurative pericarditis in which careful bacteriological examinations are recorded showed that the pneumococcus was noted 9 times, the streptococcus 5 times, the pneumobacillus twice, and the staphylococcus 3 times, the latter occurring twice in association with one of the other bacteria.

DISEASES OF THE RESPIRATORY SYSTEM.

Croup.—Sziklai³ considers croup a distinct disease from diphtheria. The stimulating action of pilocarpin upon the glandular systems of the skin and mucous membranes suggests the drug in catarrhal laryngitis, for which condition it is used with satisfaction by other observers. By a peculiar process of reasoning the author comes to the conclusion that for all other conditions to which the term "croupous" has become attached, without regard to the pathologic condition present, pilocarpin must be a specific, and he enumerates here croupous bronchitis, croupous pneumonia, and croupous nephritis.

Pneumonia.—Berend⁴ reports several cases of fibrinous pneumonia to show that this disease may give an intermitting fever-curve without the existence of malaria or other mixed infection. Breton⁵ records a marked case of pseudomeningitis in the course of a bronchopneumonia of the right

¹ Brit. Med.-Chirurg. Jour., June, 1894.

² Rev. mens. des Mal. de l'Enfance, Aug., 1894.

³ Jour. of Laryngol., Rhinol., and Otol., July, 1894.

⁴ Jahrbuch f. Kinderheilk., Bd. xxxix. S. 12.

⁵ Rev. mens. des Mal. de l'Enfance, Sept., 1894.

apex in a child of eighteen months, in which a fatal prognosis was given. The child, however, made a complete recovery. All the classic symptoms of meningitis were present, except retraction of the belly and constipation, and the author thinks that had due attention been given to the absence of these two symptoms error in diagnosis and prognosis would have been avoided. Holt¹ thus briefly sums up the treatment of pneumonia: 1. *Lobar pneumonia*.—In a large number of cases only hygienic treatment is required. The patient is to be kept in bed until the physical signs have cleared up. An oil-silk jacket is to be worn throughout the attack, and small doses of phenacetin or antipyrin given to relieve restlessness, cough, etc. when they are unduly severe. The temperature should not be interfered with unless exceedingly high; then a cold pack is indicated. Stimulants in most cases are not needed, but alcohol, if required. Use counterirritation by mustard if there is much pain or much bronchitis. Let there be plenty of fresh air in the room throughout the attack. Use care not to overdo the matter of feeding when the temperature is high. Watch for pleurisy as the principal complication. 2. *Bronchopneumonia*.—The patient to be kept in bed until complete resolution occurs. Counterirritation by mustard is advised, and inhalation of vapor from croup-kettle or vaporizer. Stimulants are to be given in secondary cases from the outset; in primary cases, when indicated by feeble pulse and general condition, and to be pushed in severe cases to tolerance of the stomach. Phenacetin is indicated for restlessness, cough, etc. Expectorants are of very little value. Emetics are to be used with the greatest discretion. Of the heart-stimulants other than alcohol strychnin is best, then nitroglycerin and atropin. Frequent changes in position are advised to prevent hypostatic congestion. Quinin is only to be used in sub-acute cases with delayed resolution. Let there be careful nursing, with change of rooms twice or three times a day when possible.

Empyema.—G. A. Sutherland² reports 4 cases of double empyema, and tabulates the leading facts in 17 cases collected from literature. As regards etiology, 14 (67 per cent.) were secondary to lobar pneumonia, 1 was preceded by influenza, 1 by bronchopneumonia, 2 are described as primary, and in 3 the history of previous illness is indefinite. This corresponds very closely with the statistics of unilateral empyema given by Adam,³ who found that in 32 cases 23 (71 per cent.) were preceded by lobar pneumonia. In the 4 cases reported by the author, occurring in children from two and a half to six years of age, the treatment adopted was double resection, irrigation, and drainage. After resection the pleural cavity was explored with the finger to break up adhesions and estimate the size of the cavity, and a short drainage-tube inserted, which was removed usually within a week. To this practice of temporary drainage he attributes the rapid recovery, the average duration of drainage in his 4 cases being seven days, as contrasted with seven weeks in the other cases published. This fact has especial bear-

¹ New York Polyclinic, Sept. 15, 1894.

² Lancet, June 9, 1894.

³ Archiv f. Kinderheilk., Bd. xv. S. 414.

ing on the treatment of cases of double empyema, where, if one side is speedily cured, the other can then be treated without danger in the same radical manner, aspiration having been performed, if necessary, in the mean time. This would seem to be the most satisfactory method, for in the reported cases of "simultaneous drainage" the collapse has frequently been alarming, and the signs of cardiac and respiratory embarrassment very marked. As regards the side to be operated on first, the greatest relief will probably be obtained by selecting the side on which there appears to be the larger amount of fluid. After the operation-wounds have healed an important part of the treatment is the employment of forced respiratory movements and chest-expanding exercises. W. E. Hughes¹ presents an admirable clinical study of empyema in childhood. He draws careful distinctions between the three different varieties as determined by the etiologic factor: *i. e.* those caused by the pneumococcus, those dependent upon the tubercle bacillus, and those produced by the pus-organisms, though it is possible that in all of them a role of certain importance is played by the pus-organisms. Early exploratory puncture is urged, even as a means of distinguishing in obscure cases between empyema and pneumonia. Termination by rupture and evacuation by a bronchus, he thinks, is unquestionably more common in childhood than in adult life, and this is most common in the metapneumonic form. Spontaneous cure by absorption is of great rarity, but is proven by one of the cases reported. In treatment he advises aspiration, which in some instances, usually of the metapneumonic type, may be successful after a single puncture. Where the case has existed a long time, or where pus-organisms are the exciting cause, or where repeated aspirations have failed, the drainage-tube is necessary. Resection of ribs he advises only in tuberculous cases. A case reported by Carmichael² in a child of seventeen months, cured after five aspirations, adds a confirmatory instance in point.

DISEASES OF THE NERVOUS SYSTEM.

Cerebral Irritability.—Périer³ in an article on sea-bathing for children enumerates among the contraindications the condition that he designates under the name of "cerebral irritability" as found in the offspring of hysteric or epileptic parents. For such cases he believes that, even when the bathing is not carried out, the mere respiration of the exhilarating atmosphere may prove undesirable. In some of these young neuropathies he believes that meningitis has been occasioned by no other exciting cause. Epilepsy and hysteria he also includes among the contraindications. His paper concludes with a consideration of the special qualifications of numerous seaside resorts.

Vasomotor Disturbances.—Soltmann⁴ reports a marked case of "anorexia nervosa" in a boy of twelve years whose mother was hysteric and a

¹ University Med. Mag., Dec., 1894.

² Edin. Med. Jour., Sept., 1894.

³ Jour. de Méd. de Paris, Sept. 16, 23, 1894.

⁴ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 1.

religious enthusiast. Voluntary and almost complete abstinence from food had lasted nearly three years, this condition coming on suddenly after witnessing a family "scene." A prompt cure followed his removal from his home surroundings, with the use of the faradic current to the head in short daily sésances. Such cases the author attributes to disturbances, probably vasomotor, of the cortical centers governing taste, smell, and hunger, which, according to experiments of Ferrier, reside in the hippocampus major and the gyrus hippocampi or in the cortex of the occipital lobe. A somewhat similar case was reported by Collins in the *Lancet* of Jan. 27, 1894.

Embolism and Thrombosis of Cerebral Vessels.—In reporting a case of left hemiplegia after diphtheria in a six-year-old child, in which an autopsy revealed embolism and thrombosis of the right Sylvian artery, Berend¹ refers to the infrequency of this accident, and discusses the probabilities of causation as between embolism and hemorrhage. In the only 3 cases he has been able to collect in which autopsies were obtained—1 of Henoch's, 1 of Mendel's, and his own—embolism was found twice and hemorrhage once (Mendel's case). According to the extensive investigations of Schrakamp, trophic degeneration of the superficial cellular structure of the endocardium is frequent after diphtheria, but frank endocarditis is not found; with this "marantic thrombi" were frequently found entangled in the papillary muscles. The author is therefore inclined to attribute hemiplegias occurring after diphtheria rather to embolism than to hemorrhage, in the absence of determining factors in the history of the case; and this especially where evidences of heart-weakness have been certainly manifest.

Meningitis.—Three cases of acute purulent leptomeningitis, due to the colon bacillus and occurring within a short period in Professor Schwing's clinic in Prag, are recorded by Scherer.² The patients were all nurslings, of a few days to a few weeks old, the oldest being the first case treated in the clinic. The fact that the bacillus coli communis has been but rarely found in cases of meningitis, and that the second and third cases developed in the institution and showed the presence of the same organism as the first case, leads the author to attribute them to indirect infection from the first case, as he thinks, through the ear or mouth by means of bathing water used in the same bath-tub in which the first child had been washed.

Hydrocephalus.—Von Ranke³ reports a case of chronic hydrocephalus in which he injected the ventricle, after tapping, with 30 ccm. of a solution of 10 gm. tincture iodine in 20 gm. water. The child improved considerably, but unfortunately died on the twenty-fourth day of an intercurrent acute intestinal catarrh, due to a change in its milk after its discharge from hospital. The author expresses himself as pleased with the operation and willing to perform it again in a suitable case.

Acute Anterior Poliomyelitis.—McPhail⁴ reports 120 cases of paral-

¹ Archiv f. Kinderheilk., Bd. xvii. S. 321.

² Jahrbuch f. Kinderheilk., Bd. xxxix. S. 1.

³ Ibid., Bd. xxxix. S. 359.

⁴ Med. News, Dec. 8 and 22, 1894.

ysis occurring in an epidemic covering an area of fifteen miles in length by twelve miles in breadth, situated to the west of the Green Mountains in the State of Vermont. The city of Rutland occupied the centre of this area. Of 91 cases fully reported, 13 per cent. died, 25 per cent. recovered completely, 30 improved, and 32 remained at the time of reporting more or less hopelessly paralyzed. Most of the cases occurred among children, though adults were not exempt. The general type of the disease was that of acute poliomyelitis, but in some cases there were elements suggestive of multiple neuritis, either as an independent affection or the common result of a common cause. Lack of facilities and material for bacteriologic research renders these observations of little scientific value, for which, however, it is but just to say, the author is in no way responsible.

Lead-palsy.—Contributions to the study of lead-palsy in children have been made by Sinkler¹ and Newmark.² The former reports 3 cases occurring in the family of a painter, the children aged ten and a half, six, and three years respectively. The symptoms presented were those of poliomyelitis—a resemblance that has been noted by several other writers; and the author suggests, as Putnam has already done, that besides the changes in the peripheral nerves chronic lead-poisoning may produce typical changes in the anterior horns of the spinal cord, and thus give rise to a poliomyelitis identical in the symptoms with the acute or, so to speak, idiopathic form of the disease. In none of these children was a blue line on the gums observed, or any diseased condition of the teeth or gums. Newmark's case occurred in a girl of six years, who had absorbed lead from the pigment used in painting the crib in which she slept. The case illustrates the fact signalized by Putnam, that in children it is the rule for the legs to be "affected as much as the arms, or more, as in paralysis from alcohol and arsenic, the symptoms generally appearing first in them." It is also noteworthy in this case that, although the arms and legs were equally affected, functional recovery took place much earlier in the former than in the latter. This occurred also in 2 of Chapin's cases³ and in 1 of Sinkler's; and, according to Newmark's study, no case has been found where the disorder persisted in the upper extremities after complete recovery of the lower. The author notes the localizing influence predominating in the lower extremity of children, and asks whether it may not be ascribed, in the words of Putnam, to the "greater and more complex use" of the child's foot.

Tetany.—Oddo and Sarles⁴ report a case of tetany in a child of eighteen months, commencing with retention of urine and general anasarca. The latter was attributed to the retention, which in turn depended upon spasm of the sphincters. The urine contained indican, which, as is now understood, depends upon abnormal intestinal fermentation. This observation, therefore, gives support to the view that tetany is due to absorption of poisons from the gastrointestinal tract. The phosphates of the urine were

¹ Med. News, July 28, 1894.

³ Med. Rec., May 17, 1884.

² Ibid., May 11, 1895.

⁴ Le Médecine infantile, Sept. 15, 1894.

greatly increased, the proportion of the earthy phosphates to the alkaline phosphates being largely in excess of the normal. Popper¹ records a case of tetany in a child of three and a half years in which attacks of intense dyspnea (R. 70 to 80 per minute) attended the severer paroxysms of the disease. This unusual occurrence is attributed by the author, first, to increased heat of the blood supplying the respiratory centers; second, to the exciting cause of tetany itself; and third, to the products of muscle-work (Zuntz-Geppert).

Chorea.—The association of chorea and rheumatism, according to Osler,² is not so frequent as is generally believed, less than 21 per cent. of his 695 cases having a rheumatic history. Of the 554 cases seen at the Infirmary for Nervous Diseases in Philadelphia, 30 $\frac{7}{10}$ per cent. presented heart-murmurs, and 30 per cent. in the smaller number observed at Johns Hopkins Hospital. On the other hand, an unexpectedly high percentage (57 $\frac{3}{4}$) of 140 patients, examined at periods from two to sixteen years after their attacks, showed evidence of damage to the heart. Of 51 cases in which the heart was normal, there was a history of rheumatism in 9, 7 of these having had the articular type. Another interesting fact was that 66 per cent. of the patients who had no history or evidence of rheumatism had pronounced cardiac lesions subsequent to the chorea—a result which emphasized the frequency of complicating endocarditis which lays the foundation of organic heart disease.

Asaprol, a soluble derivative of naphthol β , has been employed with success by Moncorvo³ in the treatment of a case of marked chorea associated with malarial infection occurring in a boy of eleven years of age. The treatment extended over a period of one month and nineteen days, during which a total of 155.5 grams were taken, the maximum daily dose of the drug reaching 5 grams. No untoward effects resulted.

DISEASES OF THE GENITO-URINARY SYSTEM.

Pathology of the Urine.—Nissen of St. Petersburg⁴ has investigated the value of Ehrlich's reaction in diseases of children. His observations extended over two years and among 462 children. Of these, 165 died in the hospital, and in 113 of these autopsies were obtained. Three groups of diseases could be made according as (a) the reaction was observed in a greater or less proportion of the cases, (b) was constantly present, or (c) did not appear at all. In the first group appear pneumonia and pleurisy, laryngitis, tubercular meningitis, diphtheria, erysipelas, caries of the ribs, and scarlatina. Under (b) were found typhoid, measles, and miliary tuberculosis. In measles the intensity of the reaction follows the rise and fall of the fever. An unusually long duration of the reaction should suggest the onset of

¹ Archiv f. Kinderheilk., Bd. xviii. S. 198.

² Chorea and Choreiform Affections, Phila., P. Blakiston, Son & Co., 1894.

³ Revue mens. des Mal. de l'Enfance, May, 1895.

⁴ Jahrbuch f. Kinderheilk., Bd. xxxviii. S. 145.

tuberculosis. In differential diagnosis the sign is of distinct value, as rubella and miliaria do not give it. With scarlatina the reaction occurs at a later period, or is, at least, little marked. In typhoid the reaction was found to be constant during the elevation of temperature, thus confirming the value of this sign as already demonstrated for adults. In the pulmonary inflammations of children the reaction will serve to distinguish a large proportion of tubercular processes, in which the sign is present, from those which are not tuberculous. In croupous pneumonia the reaction was found in about half the cases, but seemed quite constant in phthisis. Under this latter term three classes of cases may be included: Chronic cheesy pneumonia without tubercle, in which the reaction is seldom found; in tubercle it is constant; and in typical generalized miliary tuberculosis it is intense and persists till death. In meningitis, as a part of miliary tuberculosis, the reaction is intense; but as an isolated lesion or accompanying caseous bronchial glands or other cheesy processes no reaction in the urine need be expected.

Following the earliest experiments of Feltz and Ritter, and the more recent ones of Bouchard, demonstrating the toxicity of normal urine, Cornélie Chernbach¹ of Bucharest has carried out a series of studies upon the convulsive state by injecting the urine of epileptic subjects into the circulation of the rabbit. Her conclusions show that such urine produces convulsions more quickly and with smaller dosage than normal urine; that prolonged boiling diminishes in part the toxicity of such urine and modifies the toxins contained in it; and that potassium bromid, when present in course of elimination in such urine, diminishes or prevents these experimental convulsions. From the fact that the urine of child epileptics produces a much more energetic and prompt action than that of adults under the same conditions, she concludes that convulsivant toxins are produced in the system of the child in much greater degree; and to this, much more than to the naturally greater impressionability of the nervous system in the child, she attributes the frequent convulsive phenomena observed in childhood during or following infectious diseases. To this also may be added alterations in the liver, which, by favoring its antitoxic activity, favor the appearance of convulsions.

Lithemia.—J. M. G. Carter² calls attention to the lithemic condition in childhood, and the derangement of the kidneys dependent upon it. Along with the intestinal, alimentary, and nervous symptoms so characteristic of this state, the patient desires to urinate frequently—sometimes has a feeling of fulness or distress in the lower dorsal region. Specific gravity is generally high (1020 to 1030); urates and phosphates often, and sometimes uric acid, oxalic acid, albumin or sugar, and occasionally indican, are found. The origin of the trouble is usually to be found in improper feeding or excessive indulgence in sugars, starches, and fats. In many cases a gouty inheritance will be found on inquiry. Regulation of diet, correction of digestive irregularity, and increased elimination, especially by the free use of water to relieve

¹ *Revue mensuelle des Maladies de l'Enfance*, Sept., 1894.

² *Jour. Am. Med. Assoc.*, Nov. 24, 1894.

the kidneys of irritating excretions, are the principal points in treatment. The author rightly suggests the danger of later development of more serious renal disease if the condition be not properly treated at an early period.

Nephritis.—Baatz¹ has seen in two brothers, aged six and eight years, affected with scabies, an acute nephritis develop after rubbing with an ointment of β -naphthol, 2 per 100. The boys were cured of the skin-affection, but three weeks later were found to have albuminuria with edema of the limbs, and one of them died. The autopsy verified the diagnosis of nephritis. Neither of these children previously had presented albuminuria or any affection capable of provoking a renal lesion. The author therefore advises against the use of this drug in such cases, despite its prompt and curative effect.

Pyelitis.—Holt² has reported 3 cases of acute pyelitis in children coming on abruptly without previous illness or any evidence of disease of the genito-urinary tract; he attributes the inflammation to some poisons carried to the kidney through the blood-vessels. The cases are of extreme clinical interest, though in the discussion several speakers expressed doubts of the limitation of the disease to the pelvis of the kidney alone.

Gonorrhea.—Vignaudon³ presents a study of gonorrheal arthritis in children secondary to vulvovaginitis or blennorrhagia of the conjunctiva. In 23 observations the knee was affected 11 times, the wrist 8, and ankle 7. In several cases more than one joint was affected, either simultaneously or successively, but 15 times to 7 the inflammation was monoarticular. Ankylosis, which is so frequent a sequel in adult cases, is unknown in the child, approached only in a few cases by a temporary stiffness in the joint. Suppuration of the joint and atrophy of the limb are the only complications. Diagnosis must depend upon finding the gonococcus in the secretions of the conjunctiva or vagina, though clinically the coexistence of vulvitis and arthritis suffices to render the blennorrhagic nature of the latter very probable.

DISEASES OF THE EAR.

Bloxall⁴ presents the results of a bacteriologic study based upon examinations of the discharge in 14 cases of otitis complicating scarlatina. The table shows that the shorter the interval between rupture of the membrane and the examination of the discharge, the more the pyogenic cocci predominate over rod forms. Cases examined on the first day showed almost pure cultures of cocci, while in the cases taken after a few days the presence of adventitious organisms, such as yeasts and sarcinæ, was very marked. The conclusions from this study show that the streptococcus pyogenes is the most potent factor in the etiology of otitis media of scarlet fever; that the less chance there is of contamination from the outer air through the external orifice, the more the pyogenic cocci predominate over rod forms, but that prior to perforation the occurrence of such organisms is not precluded, since

¹ Semaine méd., Oct. 24, 1894.

² Arch. of Ped., Nov., 1894.

³ Rev. mens. des Mal. de l'Enfance, May, 1895.

⁴ Brit. Med. Jour., July 21, 1894.

they may ascend by the Eustachian tube from the mouth; that next to the streptococcus the most important organisms are the staphylococcus albus and aureus; and, finally, that apparently the diplococcus pneumoniae of Fränkel or the bacillus pneumoniae of Friedländer does not play such an important part in the otitis media of scarlet fever as in that due to other causes.

The treatment of acute otitis in children at the hands of the general physician forms the subject of a valuable paper by Dench.¹ In the initial stage he advises a wet-cup or leech to the region of the tragus, with confinement to bed and free catharsis. If the case is seen very early, the abstraction of blood may be followed by an opiate sufficiently powerful to keep the child quiet for five or six hours, with hopes of aborting the attack. For further relief of pain, dry heat from a Japanese pocket-stove or other extemporized means may be used, or more directly by a hot salt-bag formed from the finger of a kid glove. Oily substances dropped into the meatus are properly condemned. Moist heat from warm-water irrigations is not approved by the author for this early stage of the affection. If pain recurs after the effects of the opiate have worn off, further use of the drug is unwise, and reliance must be placed upon dry heat and local abstraction of blood till discharge appears. Irrigation with warm antiseptic solution is now advised, mercuric chlorid 1:5000, phenol 1:100, or boric acid to saturation, being approved. When the discharge persists a few drops of a saturated solution of boric acid in alcohol dropped into the meatus after syringing may be employed with safety, and usually suffices. The importance and advantage of early incision of the drum-head are properly emphasized, and this procedure usually prevents extension to the mastoid, being considered by the author more efficient than the Wilde incision behind the auricle.

THERAPEUTICS.

Administration of Quinin.—A. K. Bond² suggests an improved method of administering quinin to children, by having the pill, made with aromatic sulphuric acid, broken up and mixed with a little brown sugar and put dry upon the tongue, when a mouthful of water will carry it into the stomach. Sometimes a small fragment of sweet chocolate may be broken up and used in place of the sugar.

Tongue-traction.—Laborde³ reports a striking instance of the value of his method of tongue-traction. A child born apparently dead was treated for ten minutes by rhythmic traction of the tongue and revived. The mother then claimed his attention for a time, and the child again ceased to breathe. All the usual methods of resuscitation were tried without avail, but rhythmic traction restored it in six minutes.

Alcohol.—Seibert⁴ deprecates the use of alcohol in the treatment of most cases of acute disease in children. In gastroenteritis, typhoid fever, fibrinous and bronchopneumonia, scarlatina, diphtheria, and nephritis he has

¹ Arch. of Ped., May, 1895.

² Semaine médicale, Dec. 5, 1894.

³ Virginia Medical Monthly, July, 1894.

⁴ Arch. of Ped., May, 1895.

found it rarely necessary or advisable to employ alcoholic stimulants, except in sudden emergency, and then only for a short time.

Caffein.—In the heart-weakness so often met with in the infectious diseases Sevestre¹ places greatest reliance upon caffein, which he gives, preferably hypodermically, in dose of as much as 5 grains two or three times a day to a child of five years and upward. Caffein is also said to be an excellent means for counteracting the collapse and syncope that sometimes follow a cold bath. For this reason the author always administers a hypodermic of caffein before a cold bath if the child shows the least symptom of cardiac weakness, etc. Injections of an "artificial serum" (60 grains common salt to the pint, sterilized) are especially recommended to increase arterial tension: 5 drachms of this solution may be injected twice or thrice daily. These injections are generally well borne, and yield good results whether used alone or alternately with caffein.

Salophen is recommended by Drews² as an efficient substitute for the salicylates in rheumatic, pyretic, and painful conditions in children. In acute rheumatism he has employed the drug in doses of 0.3 to 0.5 gm., repeated every two hours (3 to 5 grams daily, according to age, from seven to fourteen years).

Trional.—Claus³ has found trional a prompt and reliable hypnotic for children, producing a physiologic sleep and leaving no headache or heaviness on the following morning. Its best effects were observed in chorea and pavor nocturnus, and in insomnia from disturbances of dentition or of indigestion; in painful conditions its action was not very satisfactory. The dose from one month to one year is 3 to 6 grains, and from six to ten years 18 to 22½ grains. It is best given half an hour after supper or fifteen minutes before bedtime, in hot milk or in confection or honey.

Calomel Fumigations in Croup.—Fruitnight⁴ calls attention to the value of calomel fumigations in croup, whether looked upon as simple or specifically diphtheric. This treatment was originally suggested some years ago by Dr. Corbin of Brooklyn; it has recently been brought into prominence again by Dr. Dillon Brown.⁵ The indications of this treatment are recession of the suprasternal notch during inspiration, with retraction of the infrathoracic walls, stridulous breathing, hoarseness or aphonia at times, and lividity of the surface resulting from the deficient oxygenation of the blood. The amount of the mercurial salt to be vaporized varies from 5 to 20 grains, repeated at intervals varying from one-half to two or three hours, according to the severity of the symptoms—in the average case 15 grains hourly. The patient is to be kept in the vapor-saturated atmosphere, within a tent, for a period varying from ten minutes to half an hour. In an experience with more than 100 cases thus treated no case has been observed in which dele-

¹ *Le Progrès médical*, Dec. 22, 1894.

² *Nouveaux Remèdes*, Sept. 24, 1894.

³ *Internationale klinische Rundschau*, Nov. 11, 1894.

⁴ *Arch. of Pediatrics*, June, 1895.

⁵ See article "Diphtheria," *An American Text-book of Diseases of Children*.

terious results have attended or followed ; in 1 case only did slight ptyalism occur after a prolonged period. The evil consequences to be guarded against are salivation, diarrhea, and especially depression and prostration accompanied by anemia, all of which can be prevented by watchfulness and proper treatment. It may be added that abortion ensued in 3 pregnant women who subjected themselves to the mercurial fumes against the doctor's repeated protestations.

NERVOUS AND MENTAL DISEASES.

BY ARCHIBALD CHURCH, M. D., AND HUGH T. PATRICK, M. D.,
OF CHICAGO.

MENTAL DISEASES.

Nervous and Mental Symptoms of Latent and Intermittent Nephritis, without Albuminuria.—Bremer¹ has noted a number of cases of peculiar mental and nervous disturbance that he has found associated with a nephritis not marked by albuminuria. The mental symptoms consist for the most part of the loss of identity, and more particularly of the loss of memory for place and time, so that these patients do not recognize their surroundings, nor have they a clear conception of the season, sometimes not of the day of the week. On the part of the nervous system there is sometimes involvement of the motor apparatus, a tendency to spasticity of the lower extremities being pronounced, and sometimes there is monoplegia or aphasia.

In these cases he has usually found two forms of characteristic leukocytes in the urine, but in other respects it is practically normal; the amount of urea is also, as a rule, within physiologic limits, and he is inclined to attribute the mental symptoms to Brown-Séquard's theory of the "internal renal secretion whose admixture with the blood is necessary to the healthy function of the nervous system." The perverted secretion seems to have a localizing tendency somewhat analogous to that of organic and metallic poisons. He has found elaterium in sufficient quantities to produce watery stools, and, alternated with blue mass, to have the effect of clearing up the sensorium. [This is perhaps in line with the opinions of Haig and the general doctrine of uricemia. Such cases have been frequently benefited in our hands by prolonged iodid-treatment, the use of alkaline waters, and the restriction of the uric-acid-forming elements of the diet, principally by the cutting off of red-meats.]

The Psychoses of Polyneuritis.—Colella read before the Medical Congress at Rome² a paper on this subject. He pointed out that in intoxications, notably with very chronic alcoholic addiction, as well as in convalescence from infectious disorders, disturbances result in the mental condition of the patient as well as in the peripheral nervous apparatus, the two being in association. He draws the deduction that the cerebral symptoms are due to the involvement of the white matter of the brain, similarly to the degen-

¹ Med. News, Oct. 20, 1894.

² *Revista Sperimentale*, xx. p. 262 (*Am. Jour. of Insanity*, Oct., 1894).

erative process taking place in the peripheral nerves. Among the symptoms amnesia is especially pronounced and is wellnigh typical. With it are associated disturbance of consciousness and association of ideas, and sometimes delirium. These symptoms point to an involvement of the association-fibers, apparently in a functional manner. He insists that there must be an underlying condition of heredity or neuropathic antecedents to enable such intoxications to thus affect the given individual. The prognosis depends upon the severity of the disease and its etiology, and is usually favorable. The therapeutics depends upon the intoxicating element.

Neurasthenia and Degeneration.—Kowalewsky¹ defines neurasthenia as a condition of irritability of the functions of the nervous system, and distinguishes two classes—neurasthenia of the intellectual sphere, and neurasthenia of the sentiments and passions. These two varieties may often be combined. Neurasthenia may heal, or degenerate into some other mental or nervous affection. Paranoia is the most frequent sequel of degenerative neurasthenia.

The Pathology of Paralytic Dementia.—Berkley,² after detailing in full the history and pathologic evidence in a carefully observed case, writes the following conclusions: 1. This is a period in which the nerve-structures begin to receive an insufficient supply of nutrient material from the blood, and in which the more active and recently acquired mental functions begin to fail; to which is added a certain degree of irritability, both muscular and mental. 2. A period in which loss of nutrient material has become so pronounced that the starving tissues begin to feed upon themselves; disturbed cellular metabolism results, which is clinically shown in the increased motor excitement and grandiose ideas. 3. A period in which the nutrient supply is so diminished, and nerve-tissue changes have become so far advanced, that there is actual disintegration of the nerve-cell, and beginning overgrowth of the support-substance—the stage of terminal dementia and pronounced muscular paresis. [The unsolved portion of the problem of the pathology of dementia paralytica seemingly lies not so much in the after-stages consecutive to vascular lesions, but in finding the primary cause of the organic degeneration of the vessels. Whether this begins in lack of nerve-tone in the arteries is entirely unknown, and, so far as the brain is concerned, must remain so for an indefinite period, owing to the failure of our present staining-agents in giving satisfactory pictures of the vascular nerves. Something can, however, be done with the nerve-supply of vessels in other portions of the body, and to these regions pathologists must turn their attention for a satisfactory solution of the problem.]

Eye-symptoms of Early Paretic Dementia.—Hepburn³ directs attention to the ocular disturbances of the early period of general paresis, making observations upon a personal acquaintance before mental symptoms had appeared, which observation was subsequently repeated upon seven other cases

¹ Bull. de la Soc. de Méd. de Belgique, Sept., 1893 (Jour. Ment. Dis., Dec., 1894).

² Am. Jour. Insan., Jan., 1895.

³ Ibid.

at later stages, and from them he deduces a number of suggestive points for the early diagnosis of this disease. First, the appearance of the optic nerve entrance is creamy, pink, or leathery. Later the disk becomes whiter and whiter, gradually takes on a bluish tint, and becomes slightly cupped, with the changes in the blood-vessels much less marked than in ordinary atrophy. In the retina there is some connective-tissue deposit between the nerve-fibers, in small patches, confined to the nasal side till an advanced period of the disease, but later invading the temporal side rapidly. Of the extrinsic ocular muscles, the interni appear to be most affected, though all the muscles may be affected to a greater or less degree. Retraction of the field of vision on the temporal side to a moderate degree was in this case a uniform symptom, and its increase was in the ratio of the progress of the disease. Steady deterioration of vision, when accompanied by the patient's statements of improvement and well-being, indicates a rapid course. Inequality in the size of the pupils is by no means a constant symptom, and when present is likely to be complicated by some constitutional taint. [As the hopeful treatment of this disease depends entirely upon an early diagnosis, the necessity of carefully examining the visual apparatus becomes apparent.]

Mental Diseases of Children and Youth.—Henry M. Hurd,¹ in calling attention to this subject, excludes idiocy, moral imbecility, and epileptic degeneration, and, leaving out mania and melancholia in those suffering from congenital mental defects, he limits his paper to the consideration of imperative conceptions, confusional insanity, melancholia, convulsive tic, and pubescent insanity, and finds that they appear in the four following classes: 1. In neurotic children with unsymmetric heads, with brains of feeble resistance to disturbing influences, and nervous organizations quickly responsive to bodily disorders, however slight. They suffer from night-terrors and show delirium after slight febrile attacks. 2. In children who have an hereditary tendency to mental disease. In many of these an apparent symmetry of head and a well-developed body exist, but the quality of the brain seems at fault. It is lacking in the ability to will efficiently, to inhibit morbid impulses, or to resist imperative conceptions. 3. In children with a feeble physique, who are unable to join in the out-door sports of others, and who thus become overstimulated by reading or have an overdevelopment of their imaginative powers. 4. In backward children, who develop slowly. The backward child is not necessarily a defective child, any more than the child who gets his bodily growth slowly is defective. Slowness of development in body and brain have sometimes been associated finally with peculiar powers. This, however, is generally more true after puberty than before. Slowness of bodily growth commonly implies nutritive debility, and backwardness of mind an allied defect in the metabolism of the brain-cell. A wise educational method would conserve this energy until nature is ready to use it. Too often, however, it is recklessly exhausted by high-pressure educational efforts, and disease results.

¹ Boston Med. and Surg. Jour., Sept. 20, 1894.

"In conclusion," he says, "permit me to add the conviction that I shall be remiss in professional duty if I do not urge upon you as medical men to call a halt in the present high-pressure educational methods in vogue in our primary schools. The feeble mental powers of growing children are taxed to the utmost by excessive memorizing of isolated and miscellaneous facts. Nervous and conscientious children are rendered morbid by the exactions of oppressive regulations or a foolish routine, which confuses moral distinctions and gives peace to the untruthful alone. Knowledge is not imparted as a means of strengthening and developing the mind, but for its own sake as useful facts. Little children are subjected to the worry of examinations and to the ruinous competition of marking and of weekly report-cards. Growing children are drilled to carry out elaborate mathematical calculations in haste, and a premium is often placed upon rapidity of performance rather than correctness. Too many branches are taught and too many hours are spent in school. In many schools children of ten years of age are compelled by reason of excessive lessons to spend hours at home, which should be devoted to play or to sleep, in the preparation of lessons. To regular school duties in many instances, especially with young girls, is added a semi-weekly music lesson which involves several hours a day of close application to routine 'practising' at the piano in a constrained position. The exercise is monotonous and wearisome to the last degree to minds and bodies already overtaxed by study and several hours of confinement to the school-room. Recreation even is converted into a fresh tyranny. Almost every girls' school has a well-equipped gymnasium where muscular exercise is made compulsory in movements designed to cultivate the physical system, and where all movements must be executed with the precision and exactness of military drill. While engaged in writing this paper I chanced to visit a gymnastic exhibition in a well-appointed school where girls varying from ten to fourteen years of age were taught. Their movements were marvellously precise and correct, and were executed with dash and enthusiasm. I was struck, however, with the nervous strain apparent in the countenances of many of these young girls. It did not seem play or recreation, but a task to be executed with as much expenditure of nervous and mental energy as any form of study. These are every-day examples of the trend of our present educational methods, and they might be indefinitely multiplied; but I spare you the further details. Is it any wonder, under these circumstances, that the mental disorders of childhood are increasing in frequency? Is it not our duty as medical men to protest against the burdens which are thus unnecessarily placed upon growing and immature brains?"

Clinical Forms of Mental Troubles following Acute Diseases.—Regis and Chevalier-Lavaure¹ state that the tendency of the day is to consider the cases of insanity connected with various infectious diseases as the

¹ Abstract from the report presented at the Congress of French Alienists, *Mercredi Méd.*, Aug. 9, 1893 (*Jour. of Ment. and Nerv. Dis.*, Oct., 1894).

result of intoxication, and that they generally take the form of what the Germans call *Verwirrtheit*, and which Charlin so well described in France as *confusion mentale primitive*. This opinion seems to have been accepted unanimously and supported by various eminent authors. This form of mental disease was previously described in France by Esquirol, Dagonet, Achille Foville, Jr., and Delasiauve. The predisposing factors are, sex, women being especially predisposed; age, from twenty to forty years; heredity is scarcely to be considered; rachitis and all weakening diseases of childhood. Causes are excesses, febrile infections, diseases and autointoxications of all kinds, confinements, lactation, traumatic and mental shocks, operations, etc. All the authors agree that this disease is the consequence of cerebral exhaustion. According to Wille's excellent description, mental confusion is an acute or chronic functional disease of the brain, beginning generally with an acute hallucinatory stage characterized subsequently by mental confusion, incoherent delirium, absence of repose without motive, alternating with intercurrent conditions of excitement and stupor. During the periods of quietness there are hallucinations and delusions that are still more striking during the paroxysms, in which the patients are sometimes sad, excited, anxious, painfully impressed, or angry; or they display all these conditions alternately. The paroxysms of excitement may approach melancholia agitata, mania (Tobsucht), or agitated delirium. They generally change rapidly and immediately into a stage of stupor. In the periods of quietness the patients betray great prostration. The mental faculties and conditions are weakened and speech is often incomprehensible and incoherent. The onset is generally sudden; the course may be continuous, remittent, or paroxysmatic, but is more often an irregular combination of the different stages. The duration varies from a few days to several months, or even years. In regard to the pathology, anemic conditions of the brain and cerebral edema with meningeal troubles have been described, which lead Wille to consider mental confusion as constituting an intermediate form of insanity between the purely functional and those with an anatomic basis. As to the classification and division, mental confusion resembles closely those conditions that are observed in different intoxications, alcoholism, saturnism, also rheumatic, cardiac, and renal insanity. Most authors admit a simple mental confusion without hallucination, and an hallucinatory confusion. But a third mixed type might be admitted which presents the symptoms of the two preceding, occurring at any period of the infectious disease, but especially during convalescence, manifesting itself in light cases by delirium of grandeur and some somatic signs, in severer cases by the symptoms of paralytic dementia, and likely to disappear rapidly or to become progressive. It will be observed that there is at present a tendency to consider the last-named malady, viz. paralytic dementia, as depending upon a toxic influence—viz. the toxins produced by the microbe of syphilis.

The Relations of Infectious Processes to Mental Disease.—Mills¹

¹ Am. Jour. of Med. Sci., Nov., 1894.

calls emphatic attention to the gradually growing belief that mental disease is the result of infection, and substantiates his thesis with numerous references to literature. In conclusion he says: 1. Specific infection must be included among the causes of mental symptoms and diseases that precede, accompany, or follow febrile and other infectious disorders. 2. Much negative evidence can be adduced in favor of acute delirium or acute mania being due to toxemia—such evidence as is afforded by autopsies that reveal neither gross nor histologic lesions; and in these cases the toxemia probably overwhelms the patient before the production of meningitis or other disease. 3. Analogies with nervous affections that are known or believed to be of microbic origin—such as multiple neuritis, myelitis, and chorea—favor the view that insanities with similar or related phenomena and lesions are also microbic in origin. 4. The evidence afforded by careful bacteriologic investigation of cases of acute insanity is thus far meager, and shows that various microorganisms may induce the same or similar types of mental disease. 5. The mental disorders of pregnancy and the puerperal state are probably, in a considerable proportion of cases, toxemic, without reference primarily to childbirth; but it cannot be regarded as proved that a bacillus of either eclampsia or puerperal mania is the sole cause of these affections.

[The important lesson is a reiteration of antiseptic and aseptic methods in obstetrics, and the elimination of all forms of toxic processes that are discoverable and manageable in the treatment of disease. It is an important fact that cases of puerperal insanity are very much less frequent among the admissions to insane asylums recently than before antiseptic midwifery was in general use.]

Acute Delirium.—Wood,¹ under the title of “Expiscation of Acute Delirium,” makes a very instructive study of this symptom, and reaches a conclusion that, if not to be heartily concurred in, is at least practically suggestive and therefore valuable. He says: “The conclusions that to my mind are probably, but not firmly, established are, that all manias of an acute type which are not intoxication-neuroses, and that are not due to the presence of organisms in the blood, are divisible into two affections, mania proper, and confusional insanity, and that each of these diseases becomes, when in its most severe form, an acute delirium. Thus, there would be, first, acute mania—that is, mild acute periencephalitis, known when in its severest form as acute delirium—that is, violent, usually fatal, periencephalitis; second, confusional insanity, without demonstrable lesion, but probably the result of changes in the ganglionic cells themselves, constituting in its severest form an acute delirium, also without demonstrable lesion, but, in fact, due to an exaggeration of the unknown ganglionic or other alteration present in the confusional insanity.”

Modern Treatment of Idiocy.—Bourneville² has an interesting paper on this subject, based upon the study of twenty-two idiotic children operated

¹ Am. Jour. of Med. Sci., April, 1895.

² Progrès médicale, June 24, 1893 (Jour. of Nerv. and Ment. Dis., May, 1894).

upon by Lannelongue by linear craniotomy. The treatment instituted was that originated by Seguin and extended by Bourneville, combined with medical and pedagogic measures. The following embodies six important points upon which the author lays great stress: 1. The surgical treatment of idiocy rests upon a hypothesis not substantiated by pathologic anatomy. 2. In the different forms of idiocy premature ossification of the cranial sutures does not exist, and partial synostosis is quite exceptional. 3. Lesions causing idiocy are generally profound, extensive, and varied, and most unlikely to be influenced by craniectomy. 4. Our present means of investigation are not such that a diagnosis of premature ossification and thickness of the skull are to be made. 5. Reports of most surgeons show that results of operations are negative, slight, or doubtful. Serious accidents, as paralysis, convulsions, or death, may follow surgical interference. 6. Medico-pedagogic treatment, founded by Seguin and improved by the introduction of new processes, always permits a decided amelioration, and often enables idiotic children to occupy some social station. The children learn through activities, by doing things and making things. They are first taught to stand erect, to walk properly, to wash their faces and hands, to dress themselves, to lace their shoes, and perform other complicated acts. These object lessons are given upon the manikin or upon one of the little patients. The joints are exercised, the muscles are rubbed, baths are administered, and all the arts of hydrotherapy are employed. For the development of speech and correct pronunciation methods in vogue in deaf and dumb asylums are utilized. Every device is employed to render numbers and calculations real and intelligible. Exercise in the training of vision are further carried on out of doors in gardens or plots laid out with this object in view. There are gardens of surfaces of geometric figures, flower gardens, vegetable gardens, orchards, fields of grain, vineyards, etc. Music occupies an important place in this scheme of mental and moral development. There are songs and movements, games, and lessons in vocal and instrumental music for the advanced pupils. Physical culture is carried on by means of systematized mechanic movements, free gymnastics, fencing, and dancing. Technical training for a trade completes the course of instruction. There are 7 workshops. The pupils learn carpentry and locksmith-work, printing, tailoring, the making of shoes, baskets, brushes, twine, etc. The results of this medico-pedagogic system of education are most surprising and encouraging.

Prophylaxis of Degeneration.—Berillon¹ shows the importance of the subject of prophylaxis of degeneration to all interested in the hygiene and amelioration of human life. As degeneration manifests itself by physical stigmata and functional and mental troubles, it also expresses itself in a special way by automatic actions and habits, and the frequency of these unpleasant habits in degenerates is explained on the ground that the inhibitory or moderating power in the healthy brain is in them more or less in

¹ *La France médicale*, Sept. 28, 1894 (*Jour. Nerv. and Ment. Dis.*, Dec., 1894).

abeyance. These habits are invariably in direct opposition to the loss of health. The biting of nails carries particles to the mouth that are detrimental to the health, and in the Parisian schools the subjects of this habit can be recognized by their general appearance. Attention and treatment both moral and medical bring about marked improvement in the general health, and seems capable of arresting further deterioration. Recognition of degeneration, therefore, as a prophylactic measure by those having the care and instruction of children, should lead to important results.

The Importance of Menstruation in Ascertaining Mental Irresponsibility.—Krafft-Ebing¹ concludes that: 1. Psychic integrity of women during their menses is a question most useful to consider in legal medicine. 2. It appears expedient to find out if the crime committed by the prisoner coincided with her menstrual period. Under the term "period" the author includes not only the days during which blood comes away, but those that precede and follow it. 3. An examination of the mental condition should be advised when the criminal act coincides with this period. This examination is indispensable when the history of the patient reveals a neuropathic taint or the existence of mental trouble during former menstrual periods, or when the act itself discloses peculiar changes. 4. When it is evident that the menstrual process exercised a powerful influence on the mental life of the subject, she should have the benefit of this fact, even if no menstrual insanity can be made out in what concerns the application of the law in the given case. 5. When the crime coincides with the epoch of menstruation in a feeble-minded person, she should be declared irresponsible, for there is reason to believe that the act was one of passional impulse. 6. But the subjects who obtain a verdict of "not guilty" on the plea of mental menstrual trouble should be considered as extremely dangerous, and are to be put under a severe watch at the epoch of their menses. The best thing is to put them into an asylum, where they will have good care and often a cure is brought about. The author cites twelve cases.

Thyroid Feeding in Insanity.—MacPhail and Bruce² give their results in the treatment of insanity by thyroid, and which, practically summarized, is to the following effect: Depressed conditions are improved, maniacal conditions are made worse. The treatment must be carried out with the patient absolutely in bed, and the action of the remedy must be watched carefully, as it is capable of setting up considerable cardiac and general disturbance. It is commonly counterindicated in acute insanity, tuberculosis, valvular heart disease, and in marasmic states generally.

Chlorobrom as a Hypnotic in the Insane.—Wade³ gives the following conclusions regarding the use of chlorobrom as a hypnotic: That this remedy is a mixture of equal parts of potassium bromid and chloral amyl dissolved in water, and was first introduced to the profession by Prof. Charters of Glasgow. The drug was administered ninety-six times to sixteen patients,

¹ Jahrbuch für Psychiat., vol. x. (Annals of Gyn. and Paed., June, 1894).

² Lancet, Oct. 13, 1894.

³ Am. Jour. of Insan., April, 1895.

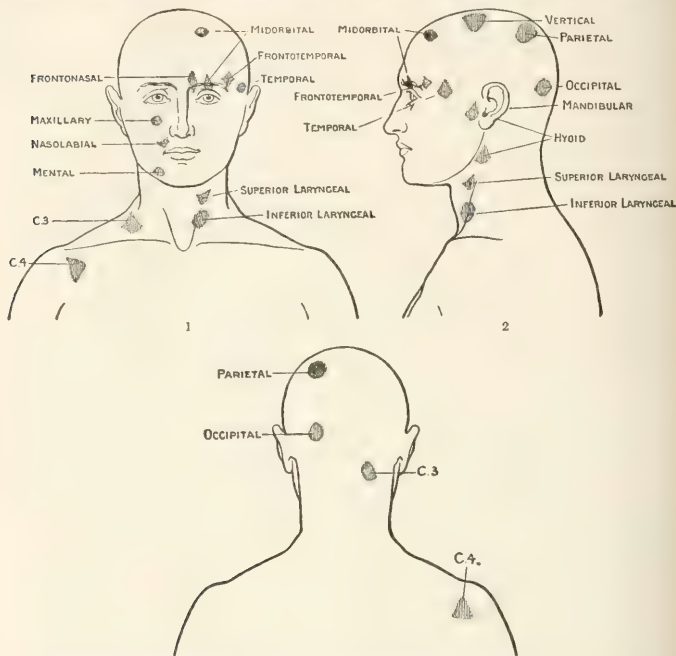
including 3 cases of acute mania, 3 cases of melancholia, 7 cases of dementia, 1 each of active melancholia, epilepsy, and periodic mania. The dose was, as a rule, 1 ounce, and was found to be sufficient to produce sleep in most cases. In the cases of acute mania one was very talkative and noisy at night. The other 2 cases were of a milder character, who, although not noisy, talked to themselves and disturbed the other patients in the hall. In all 3 cases the drug produced sleep on an average of three-quarters of an hour after administration, and continued six hours. The drug was not used over six times in each case, after which the patient quieted down and required no further use of any hypnotics. In 3 cases of melancholia it was employed with excellent results. Two were cases of simple melancholia with delusions; the third was a case of chronic melancholia, who refused to go to bed until some medicine was given. "Heretofore when sulfonal or paraldehyde was used, it was necessary to administer some quieting draught during the day, but since she has taken the chlorobrom this has not been necessary. In 7 cases of dementia, who, while not continuously requiring some sleeping medicine, occasionally became noisy during the night, the drug did not fail to produce the desired result in a single case. It was employed in one case of insomnia following epilepsy. The patient had not previously been on the bromid treatment, and I thus account for its favorable action in this special case. I have not been able to test the drug in cases of general paresis. There seems to be some doubt as to its action in that disease. In conclusion, I think it justifiable to state, in the words of Doctor Keay, that we have one safe and reliable addition to our already too small list of hypnotics; that it is most favorable in melancholia, especially of the milder type; and that in acute mania its action is fully as reliable and lasting as any other hypnotic we possess."

Referred or Sympathetic Pains in Visceral Disease.—Head¹ has continued his investigations regarding the referred pain of visceral disease² to the regions above the first dorsal segment. He claims to demonstrate that each organ in the head (the nose, eye, ear, teeth, tongue, salivary and other glands, tonsils, larynx, and the brain itself) stands in relation with one or more areas on the surface. These areas do not correspond to different branches of the fifth nerve and they overlap but very slightly. Affections of serous cavities, of superficial structures, and of the orbit do not cause referred but local pain. The pain of migraine is not a referred pain. The different areas to which pain is referred are the following (see Plate XV. and Figs. 1, 2, and 3): *Frontonasal*. This area forms a racquet-shaped patch with the larger part lying over the forehead. It extends from 2 to 2½ in. above the root of the nose, reaching the junction of the hairy scalp with the forehead, meets its fellow of the opposite side, except just over the root of the nose, at the level of the eyebrow, extends laterally from ¾ to 1 in. from the middle line, and is continued downward as a flap along the side of the nose to the ala nasi. It becomes

¹ Brain, autumn number, 1894.

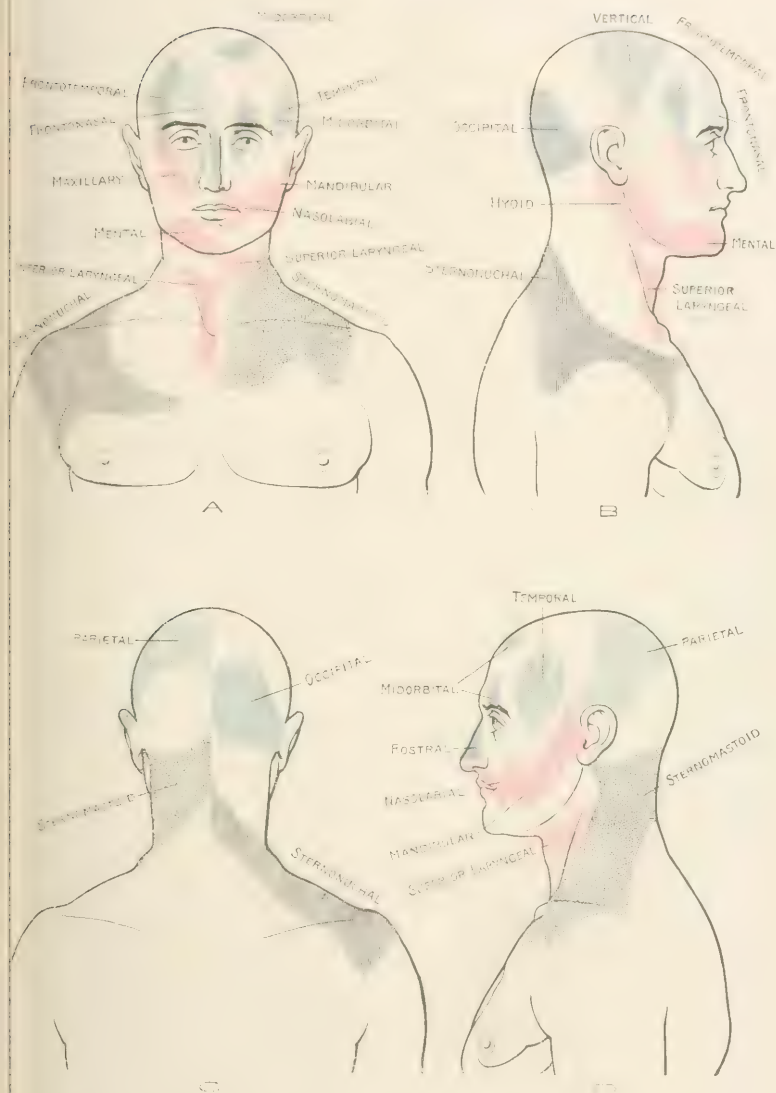
² Ibid., spring number, 1893.

painful and tender in affections of the cornea, anterior chamber of the eye, upper part of the nose, and incisor teeth of the upper jaw. *Midorbital*. This area, when fully developed, consists of two distinct portions. The lower is an irregular triangle, base down, over the middle of the eyebrow,



FIGS. 1, 2, and 3 show the so-called "maxima" of the areas—the points where the pain and tenderness are most intense. Each area has its maximum point, and the presence of this point is sufficient for diagnostic purposes, even when the area cannot be outlined (Brain, autumn number, London, 1894).

involving the greater part of the upper lid, and sending a flap to the inner part of the lower lid. The upper is a small patch over the extreme front of the hairy scalp and exactly above the other. *Frontotemporal*. This area rises from the outer part of the eyebrow (taking in the outer half of the lower lid and the outer part of the upper) for about 3 in. above the external canthus and curves inward to the frontonasal area. It is but rarely affected alone in disease of the organs of the head, excepting the iris, but is common as one of the areas of reference from the thoracic viscera and, in conjunction with the temporal area, in glaucoma. *Temporal*. This is an oval area, directly over the temporal fossa, from 3 to 4 in. high and about 2 in. broad. It appears in affections of the vitreous chamber of the



FIGS. A, B, C, and D represent the approximate limit of the areas as outlined. Those colored blue are associated with areas of tenderness on the chest and abdomen. Those colored red become tender in affections of the head and neck, but, unlike the blue group, are not correlated with areas of tenderness on the thorax and abdomen. The two black areas do not belong to those of the head, but are in reality the highest areas of the trunk. They behave like areas on the thorax, and are associated with certain dorsal areas on the scalp. (Brain, Autumn number, London, 1891.)

eye, in caries of certain teeth of the upper jaw, and is associated with the upper gastric area, frequently accompanying, therefore, nausea and vomiting.

Vertical. This area is triangular, with the base about 2 in. in width, along the middle line of the vertex, and the apex reaching a point just above and in front of the insertion of the ear. It is found in affections of the extreme posterior portion of the eye, in cases with pent-up discharge or rise of tension in the middle ear, and in hepatic and gastric disturbances. *Parietal.* The anterior border of this area corresponds roughly to a line drawn vertically from the insertion of one ear to that of the other, the posterior border to a line drawn at an angle of 45 degrees with this one, the superior border coinciding with the middle line. It is occasionally affected in ear-disease (never alone), but more frequently in disturbance of abdominal or thoracic viscera.

Occipital. This area, roughly oval, lies between the foregoing and the occipital protuberance, and is affected only in abdominal disease and (rarely) in lesions of the posterior part of the dorsum of the tongue. *Rostral.* An unimportant area on the front of the nose, sometimes tender in nasal and thoracic affections.

Maxillary. This area curves upward and backward from the nasolabial fold, tapering to a point posterior to the lateral border of the orbit, the upper border corresponding to the lower orbital margin. To it also belong that part of the upper jaw holding the bicuspid teeth and the adjoining hard palate. It is principally affected in dental caries. *Mandibular.* This area is roughly-curved, triangular, and lies over the ramus and part of the body of the lower maxilla, becoming painful and tender in disease of the last two superior molars. *Hyoid.* This area lies posterior and inferior to the one just described. It includes the mastoid, the meatus and lobule of the ear (not the tragus), and when affected may simulate mastoid disease. The introduction of the aural speculum is painful, and the author has seen the membrana tympani lanced when the fault lay in the molar of the lower jaw. As a rule there is also tenderness over the edge of the tongue. The area is affected in disease of the ear, tonsils, tongue, and teeth.

Superior Laryngeal. This is also triangular in shape, lying on the neck below the jaw, base over the lateral surface of the larynx, the apex on a line dropped vertically from the ear. The wisdom-teeth and posterior part of the dorsum of the tongue refer pain to this area, and the patient complains of pain in the throat and difficulty in swallowing.

Inferior Laryngeal. The two areas together form a triangular patch on the front of the throat between the sternomastoid muscles, the base up, about on a level with the cricothyroid membrana, the apex at the interclavicular notch. It is tender in laryngeal and sublaryngeal affections, may simulate a globus, and stimulation of the area will cause a tickling in the throat and a reflex cough.

Nasolabial. This includes the upper and part of the lower lip, tip and under surface of the nose, and part of the cheek; it is affected in dental caries, and the patient complains that the upper lip is "swollen and tender" and that the tip of his nose is sore.

Mental. This area lies below and lateral to the angle of the mouth and slants forward to the tip of the chin. At the same time the anterior half

inch of the tongue is tender. It occurs in connection with affections of the lower incisor and canine teeth and anterior part of the tongue. *Sternomastoid*. This corresponds approximately to the posterior surgical triangle of the neck, is not primarily tender in disease of any organ of the head or neck, but is an important area of referred pain from the chest. *Sternonuchal*. The median border of this area extends from about the fourth cervical spine to the seventh. From here it spreads down to the point of the shoulder and over in front not unlike a very broad collar, leaving the root of the neck free, sending one point down in front of the axilla on to the arm as low as the border of the pectoralis major, and another inward to and about over the third costosternal junction. This area of pain and tenderness appears solely in answer to disturbances in the thorax and abdomen.

In affections of the various head-organs the pain is referred as follows, and it is to be borne in mind that it is always associated with cutaneous tenderness, which can generally be easily outlined by tapping with the head of a pin: *Eye*. Hypermetropia and hypermetropic astigmatism, midfrontal; cyclitis, midorbital and frontotemporal; keratitis punctata, frontonasal and midorbital; iritis, frontotemporal, maxillary, and temporal; glaucoma, temporal chiefly, but also frontotemporal and maxillary, and not infrequently the teeth are also tender. *Teeth*. Any lesion superficial to the pulp-cavity does not cause referred pain; two upper incisors, frontonasal; upper canine and first bicuspid, nasolabial; upper second bicuspid, maxillary or temporal; upper first molar, maxillary; upper second molar, mandibular; upper third molar, mandibular and sometimes hyoid; lower incisors, canine and first bicuspid, mental; lower second bicuspid, hyoid or mental; lower first and second molars, hyoid—patients complain of pain in the ear and behind the angle of the jaw; lower third molar, superior laryngeal. *Ear*. Lesions of the meatus do not cause referred pain; membrana tympani and middle ear, hyoid; elevation of tension in the middle ear, vertical and occasionally parietal in addition. *Tongue*. Anterior part, mental; lateral part, hyoid; posterior part, superior laryngeal. *Tonsil*. Pain in the ear and behind the angle of the jaw (hyoid), but if the process is acute with rise of temperature the pain is more generalized. *Nose*. The majority of the cases of disease of the nose cause no referred pain. When present it is located as follows: disease above the middle turbinated bones, frontonasal or midorbital; that part of the nose associated with the lachrymal duct (occasionally), midorbital; posterior nares (rarely), nasolabial. *Larynx*, rarely has referred pain, but in tubercular disease the superior or inferior laryngeal area may be affected. *Brain*. The pain may be divided into two kinds: local with deep tenderness, due to the involvement of the membranes primarily or secondarily; and referred pain with superficial tenderness, occurring in deep lesions and due to increase of intracranial pressure.

Affections of the thoracic and abdominal viscera cause headache with cutaneous tenderness, which in location stands in relation not to the organ affected, but to the position of the tenderness on the body occasioned by its

disease.¹ The reference of pain from these lower areas is as follows: Pain and tenderness of the subumbilical (tenth dorsal) area cause pain and tenderness in the occipital area; ninth dorsal, in parietal area; eighth dorsal, vertical; seventh dorsal, temporal; sixth dorsal, frontotemporal; fifth dorsal, ditto; fourth dorsal, ditto, or midorbital; second and third dorsal, ditto. The areas from the fourth cervical to the first dorsal show no referred pain in visceral disease. Third and fourth cervical areas (sternomastoid and sternonuchal), frontonasal. Affection of the areas below the tenth dorsal is not associated with headache. The tenth dorsal area is affected in disease of the ovaries, testes, liver, and greater part of the midgut, the eleventh dorsal in disease of the Fallopian tubes, uterus, and bladder; so when we have headache in disease of these viscera it will be found to be referred from some area of pain and tenderness above the tenth dorsal, which often occurs. From the third cervical to the tenth dorsal areas, pain and tenderness may occur without headache or scalp-tenderness, but they are then usually slight or transient, while the headache and scalp-tenderness may be in excess of the body-pain. [These various areas as outlined by Head will probably be found to be too schematic, and the regularity of their occurrence and location exaggerated, but he has evidently collected and examined his cases with the greatest industry. The corroboration of other observers is needed, but the subject promises to be most fruitful and deserves attention.]

Alcoholism.—The following are the conclusions of Bellamy,² based on the treatment of 25 cases by trional alone: 1. The delirium is controlled with greater rapidity and safety by trional than by other hypnotics. 2. In the majority of cases a marked stimulant effect is observed, possibly due to the methylic and ethylic elements of the drug. 3. Trional possesses antipyretic properties. 4. It is well borne by the stomach, and is absorbed by the rectum. 5. No unpleasant after-effects were observed. The dose was 20 grains with 10 minims of tincture of capsicum. If no hypnotic effect was noticed in half an hour, 10 grains more were administered, and one hour later 20 grains, if necessary.

Treatment of Alcoholism.—The following hints are taken from a paper by Clark:³ Severe nerve-pains in an alcoholic subject indicate that he needs food or alcohol or both. In the treatment the amount of spirituous liquor should be gradually diminished, and then malt liquors substituted, beginning with the stronger forms. As the alcohol is reduced the amount of food must be increased. For the promotion of sleep, the heavy malt liquors, chloral, strontium, bromid, and sulfonal are the best. For the frequent gastritis he prefers frequent draughts of hot Weisbaden water taken on an empty stomach. Those who eat heavily of meat and eggs do not so rapidly succumb to alcohol nor so readily develop renal disease as light eaters and vegetarians. The heaviest meal should be the last one of the day, but should be almost entirely nitrogenous, as the stomach during sleep is comparatively quiescent,

¹ The body-areas of referred pain were described in Head's previous paper, loc. cit.

² N. Y. Med. Jour., July 21, 1894.

³ Amer. Medico-Surg. Bull., Aug. 15, 1894.

and therefore only proteids should be taken that are entirely digested in this viscus.

The Keeley Specific for Inebriety.—We notice in the annual report of Dr. Crothers, superintendent of the Walnut Lodge Hospital, the pregnant statement that of the 58 inebriates treated during the year in that institution 26 had previously received treatment at Keeley institutes and 11 had been treated by other gold-cure specifics.

Hyperidrosis occurs as a symptom in many nervous diseases, organic and functional, and its presence is often difficult of explanation. The following are recent examples: Kustermann¹ reports a case of acute myelitis in which there was profuse perspiration above the level of the girdle-sensation and none at all below. Sharkey² reports a case of tumor of the pons Varolii and left crus cerebri in which there was for months excessive generalized perspiration, which finally disappeared without treatment. Hutchinson³ describes the case of a woman of sixty-four who for four years had been troubled by excessive sweating on the right side of the face and scalp. She was at times also greatly annoyed by an excessive flow of saliva, but could not say if it was unilateral. There was great irritation of the right side of the tongue, and for two years taste was totally abolished. It was normal at the time of the examination. The author offered no explanation of this case, but the patient gave a decidedly neurotic history, and the symptoms seem to point with some degree of probability to hysteria. Pope⁴ reports a peculiar case in which there were daily attacks of neuralgia preceded by sweating confined to a bald spot on the head. Rockwell⁵ reports a case of unilateral hyperidrosis in a feeble old man which the author thinks was due to some organic affection of the cervical sympathetic. A case of hyperidrosis cured by hypnotism is reported by Backmann.⁶

Akinesia Algera.—This affection was first described and so named by Möbius,⁷ because the essentially distinguishing feature of the affection is loss of motion on account of the pain that motion occasions. Two years later Erb⁸ contributed the report of a case, and about a year later still⁹ was able to report the patient as practically cured, although he had been ill for twenty-three years and confined to bed for fourteen years. The treatment was essentially psychic (suggestive) and symptomatic. Constant but careful effort was made to impress upon the patient that his sufferings were subjective; he was encouraged to fight back to health himself, and all treatment for digestive and circulatory troubles was so arranged as to be mentally impressive. Erb concludes that akinesia algera is not a separate disease, but one of the forms of expression of the functional neuroses of psychic origin. In the same journal v. Bechterew¹⁰ reports a recent case as well as two

¹ Arch. für Psych., Bd. xxvi.

² Clinical Journal, Dec. 26, 1894.

³ Med. Rec., Oct. 27, 1894.

⁴ Deutsch. Zeit. für Nerv., Bd. i. p. 121.

⁵ Id., 1894, Bd. v. p. 424.

⁶ Brain, summer number, 1894.

⁷ Am. Medico-Surg. Bull., Sept. 15, 1894.

⁸ Soc. de Biologie, Jan., 1894.

⁹ Id., Bd. iii. p. 237.

¹⁰ Ibid., p. 430.

earlier ones (one dating back to 1880) which he thinks belong in the same category. He classes the affection among the neuroses, but is inclined to hold it distinct from hysteria, hypochondria, and neurasthenia. [In our opinion, however, there is no occasion to regard it as other than a manifestation of already well-known neuroses, some cases, as Bechterew's, being distinctly hysteric, and others, as Erb's, more hypochondriacal.]¹

Neuralgia, etc.—Cagney² in making a plea for the hypothesis that nearly all so-called neuralgias are really neuritides, emphasizes the fact, not sufficiently well known, that the pain of neuritis and organic disease may be not only paroxysmal, but periodic, and relates a case in point. A woman suffered intensely from neuralgic pains of the head and arms. The attacks occurred at regular hours twice every day. The patient had long resided in a malarial district, had had typhoid fever, and the spleen was enlarged. The possibility of syphilis had been dismissed by a competent syphilographer, but a careful examination showed some reaction of degeneration, and the patient in the course of time developed a syphilitic eruption and was cured by large doses of the iodids. As to treatment, he makes the following (among other) suggestions: In anemic neuralgia arsenic is the best remedy; in the gouty state, besides the ordinary remedies he finds colchicin in $\frac{1}{30}$ -grain doses and muriate of ammonia in 20-grain doses particularly useful. The latter agent, which has long been vaunted as an antineuralgic, the author thinks owes its reputation to its great efficacy in those cases in which an hepatic stimulant and an agent to promote metabolism is needed. For the obscure pains from which gouty subjects suffer, and especially for a form of enteralgia probably dependent on duodenal indigestion, he recommends piperazin very highly. In doses of 5 grains, with alkalies and carminatives, it seldom fails. Ferrand³ reports good results in sciatica and intercostal neuralgia from painting a mixture of equal parts of guaiacol and glycerol over the course of the nerves. No ill effects were noted. For trigeminal neuralgia Karewski⁴ recommends the procedure introduced by Thiersch of tearing out the branches of the fifth nerve, and reports six cases with five cures and one failure, the last not being a suitable case for the operation, as there was extensive intracranial disease. With one exception the time which has elapsed since the operation (nine, ten, eight, and seven months, and three and a half years respectively) is too short to allow of definite conclusions. The operation breaks off the trunk in the bony canal; it cannot be torn out as far back as the base of the brain. Headley⁵ insists that before the patient is subjected to an operation he should be given the benefit of a systematic and varied treatment. He relates the case of a man who suffered from the most severe form of facial neuralgia, and who was relieved for various lengths of time by galvanism, static sparks, and hydroelectric baths, so that he was kept in a

¹ See in addition Möbins, *Deutsch. Zeit. f. Nerv.*, Bd. ii. p. 436; Longard, *ibid.*, p. 455; König, *Centralbl. f. Nerv.*, March, 1892.

² *Clin. Jour.*, Feb. 20, 1895.

⁴ *Deutsch. med. Woch.*, Dec. 27, 1894.

³ *Jour. des Pratiq.*, No. 30, 1894.

⁵ *Lancet*, March 17, 1894.

state of comparative comfort for more than six months,—up to the time of the report. Pope¹ justly calls the combination of alcohol, tobacco, and a late supper a “powerful trinity” in the etiology of neuralgia. In the treatment he claims excellent results from the use of electricity, especially static insulation and breeze, and the electric bath. Among other remedies he prefers the hot-air bath, the head being enveloped in a wet turban, followed by douches of gradually lowered temperature; spinal hot-water or ice-bags, local anesthesia of the painful points, and general tonics, iron, arsenic, and phosphorus. Foy² reports most favorably on the use of analgen after an experience covering about 200 cases. A full dose, from 10 to 15 grains, must be given and is to be repeated in two or three hours. Lippi³ has tried neuridin as an analgesic, and observed no unpleasant effects from doses of from 8 grains to a dram and a half, but thinks it inferior to phenacetin. Oppenheim recommends the same remedy in neuralgia, headache, rheumatism, and other cases when an analgesic is wanted. Dose, 20 to 30 grains. De Buck and Vanderlinden⁴ found salophen an excellent analgesic in doses of 3 grains or more per day. No unpleasant symptoms were observed. In neuralgia and other headaches Thomson⁵ recommends large doses of ergot (1 dram of the fluid extract) at the onset, to be repeated if necessary. For migraine Gray⁶ very strongly endorses Haig’s treatment: viz. 20 drops of nitromuriatic acid before meals and from 3 to 5 grains of sodium salicylate after meals.

Acroparesthesia, Erythromelalgia (Numbness of the Extremities).—This annoying affection has been much written about of late years, and various theories as to its nature and opinions as to the best mode of treatment have been proposed. Sinkler⁷ adheres to his original idea that the trouble is due to hyperemia of the nerve-trunks or terminal filaments, and still finds ergot the best remedy. But, although ergot nearly always relieves, iron, strychnia, quinin, and change of air are frequently required for a permanent cure. The most frequent etiologic factors are occupation (washerwomen, seamstresses, etc.) and the menopause.

GENERAL NERVOUS AFFECTIONS.

Tetanus.—The antitoxin treatment of tetanus bids fair to become as general as the like treatment of diphtheria, at least when the remedy shall have become rather cheaper and more accessible. The product at present the most frequently employed is that of Tizzoni and Cattani,⁸ and we give first their directions for its use, following with the reports of a sufficient number of cases to form the basis of an estimate of its practical value:

This antitoxin, which is nothing else than antitetanic serum prepared in the dry state and by an absolutely aseptic method, keeps for a long time without

¹ Am. Med.-Surg. Bull., Sept. 15, 1894.

² Il Policlinico, Feb. 15, 1895.

³ Jour. Nerv. and Ment. Dis., Feb., 1894.

⁴ Med. News, Aug. 18, 1894.

⁵ Med. Press, June 13, 1894.

⁶ La Flandre méd.

⁷ Am. Jour. Med. Sc., Oct., 1894, p. 388.

⁸ Med. Press., Aug. 15, 1894.

change if preserved from damp; the flask that contains it is therefore to be opened only at the moment of preparing the injection. As a solvent distilled water is to be used, boiled for several minutes and then cooled, in the proportion of 1 part by weight of desiccated serum to 10 parts of water. The tetanus antitoxin is to be administered in subcutaneous injections by a Pravaz syringe, of a capacity greater than that of the ordinary syringe (5 to 10 cm.), in any part whatever of the body, by preference in the abdominal wall and the anterior surface of the thigh. The instruments that are used for preparing the solutions and making the injections must first of all be rendered aseptic by heat (ebullition, heating over the spirit lamp), and not by means of chemic disinfectants that may eventually alter the antitoxin itself; on the other hand, the different objects sterilized by heat must be allowed to cool before being brought into contact with the antitoxin, which decomposes at slightly elevated temperatures. The cure of tetanus by the antitoxin being surer and quicker in proportion as tetanic phenomena that present themselves at the beginning of the treatment are of less gravity and extent, the injections should be commenced so soon as possible. The quantity of antitoxin to be injected varies in general with the gravity of the case and with the moment of the disease when the treatment can be commenced. With the adult, when the treatment is commenced on the appearance of the tetanic phenomena, when the conditions of the wound, original source of the tetanus, and the symptoms that have already appeared of the malady do not portend in the occurrence an exceptional gravity, it will be necessary, for the first injection of antitoxin, to use half of the contents of the glass tube; the other half, divided into four doses, is to be injected during the following four days with more or less interval between the injections, according to the effects produced by these proceedings upon the course of tetanic phenomena. If, on the contrary, the case, by the shortness of the incubation period, by the rapid extension of the tetanic phenomena, and by the predominance and intensity of the "bulbar" phenomena shows itself to be of great gravity, or further, if the treatment has been commenced a few days only after the appearance of the malady, even in that case if, under the latter circumstances, the phenomena do not present as yet any special gravity, it will be necessary to employ, in a first injection, all the antitoxin contained in the tube. A second tube will suffice for the succeeding injections, which, in accordance with the results obtained with the first, are to follow more or less closely. With still greater reason, when in consequence of the extension or of the special conditions of the wound there is reason to believe that the quantity of tetanic poisoning absorbed is considerable—and that, above all, when nothing has been done, or was possible to be done, to cause the disappearance or disinfection of the poisoned wound—in this case, even if the treatment has been begun at the very outset and in the absence of alarming phenomena, the malady must be regarded as very serious, and be treated with the maximum dose. And on this point it is worth while observing that even in proportions greater than those indicated the use of the antitoxin may be employed without

the least danger. For children, including the newly-born, the same rules are to be observed as for adults, only the injection-dose is to be reduced at least by half. The employment of antitoxin does not exclude the employment of other medicaments, such as hypnotics adapted to relieve the sufferings of the sick and to combat temporarily certain of the symptoms of tetanus; likewise, it does not exonerate the surgeon, in case the wound that has caused tetanus is not yet cicatrized, from keeping it perfectly aseptic, in order to diminish the quantity of poison that it can absorb, and, in short, from practising upon it every operation counselled by the rules of general surgery. This dry serum is obtained from the horse; it is endowed with an immunizing power of more than from 1 to 100,000,000, demonstrated on albino rats submitted to tetanic infections of poisoning, causing the death of the animals in four or five days. The dose of 4.5 grams contained in the tube is, consequently, as results from experiments, a little more than the minimum dose curative for a man.

Hewlett¹ has collected 50 cases treated by antitoxin, with 16 deaths. One was idiopathic (recovery), one was tetanus neonatorum (death), and the remainder traumatic, giving a mortality for the last of 31 per cent. As the mortality under the old treatment is said to be about 90 per cent., this is a distinct gain, but, as in the case of all new remedies, we are to suppose that more favorable than unfavorable results have been reported; so the implied mortality by the new treatment probably somewhat exceeds these figures.

Robert Cuff² reports a case in a boy of six, of medium severity, although there were spasms every few hours. The onset was fifteen days after the injury, and the specific treatment was begun on the third day, 4 grains of the dried antitoxin being given about every two hours. There was some immediate improvement, and the remedy was discontinued after five days, but it was two weeks before the spasms ceased entirely. A well-defined roseolar rash appeared on the ninth day. (See the report of Zaggl, below.)

Hacker³ of Vienna reports 2 cases, 1 of a man of twenty-two, the onset being three days after the injury. In spite of large doses of narcotics he became rapidly worse, and on the third day was in a serious condition, when the antitoxin treatment was begun with immediate beneficial effects, and recovery in eighteen days. The second case was of a boy of fifteen years, the onset five weeks after injury. The antitoxin treatment was begun on the fifth day, when the spasms were very severe and almost constant. By the second day thereafter improvement was noticed and he recovered in sixteen days. It may be of interest to note that the antitoxin for these 2 cases cost \$22.00.

Thompson⁴ reports an interesting case. By the thirteenth day the patient, a boy of thirteen, in spite of various kinds of treatment, was evidently *in extremis*, when the author began to use a "tetanus toxin" made after the method of Brieger; that is, by growing fresh tetanus-germs in a strong

¹ The Practitioner, April, 1895.

² Med. Press, July 11, 1894.

³ Quart. Med. Jour., Jan., 1895.

⁴ Med. Rec., Jan. 5, 1895.

bouillon. There was immediate improvement and the boy went on to an uneventful recovery. A pure culture of the tetanus bacillus was obtained from scrapings about the hole in the child's boot made by the entrance of the rusty spike which wounded the foot. Dean and Evans¹ each report one case cured by antitoxin-injections after severe symptoms had developed. Bauer² reports the case of a man of twenty-six. Two days after the onset the symptoms had become very severe, and the first and only injection of Tizzoni's antitoxin was given. The patient died the next day. Doerbler³ reports a case of moderate severity. On the eighth day the prognosis was considered to be rather favorable. The antitoxin was begun at this time and the case recovered, but the evidence of this case is evidently not of great value. In the case of Marriott,⁴ a butcher of twenty-eight showed the first symptoms six days after the injury. Six days after the onset the symptoms were very marked and the first injection (2.5 grams) was given. The next day there was some improvement and the injection was repeated, and 0.2 to 1 gram was given daily for two weeks, the patient making a good recovery. On two occasions a hypodermic injection of morphin with physostigmin was given in addition to the antitoxin, and with good effect. Giusti and Bonaiuti⁵ report a severe case treated with the serum of immunized horses and dogs. The first symptoms appeared twenty-two days after the injury, and in spite of treatment with chloral and steam baths the patient grew rapidly worse. On the fourth day the injections were begun; within twenty-four hours there was slight improvement, and the treatment was continued for several days, although there were no symptoms of tetanus after the fifth day. The case of Schwarz⁶ was of a man forty-one years old, the period of incubation unknown; antitoxin treatment was begun on the third day. The patient showed considerable improvement till the seventh day, when a large amount of albumin appeared in the urine, heretofore normal, the temperature became elevated, and he died suddenly of heart-failure.

J. Lacy Firth⁷ reports a case of tetanus neonatorum. The symptoms began eight days after birth, and the treatment by antitoxin was begun on the eighth day of the disease, when the child had been in a critical condition for some days. It received 0.4 gram the eighth day, 0.8 gram (two injections) the ninth day, and 0.8 gram the tenth day, and died seven hours after the last injection. No autopsy was made; clinically the case was anomalous, and the remedy was not begun until the child was *in extremis*; so positive conclusions can scarcely be drawn from this case.

G. Caretti⁸ records a case of "head-tetanus" treated with antitoxin. A woman aged forty-four received an injury to the head, and on the sixth day noticed a slight trismus, which two days later was very pronounced. Antitoxin was then injected and the treatment was continued some days. Im-

¹ Brit. Med. Jour., Sept. 15, 1894.

² Münch. med. Woch., No. 15, 1894.

³ Berl. klin. Woch., Sept. 3, 1894.

⁴ Brit. Med. Jour., Jan. 19, 1895.

⁵ Wien. klin. Woch., Nov. 8, 1894.

⁶ Brit. Med. Jour., Jan. 19, 1895.

⁷ Wien. med. Woch., Dec. 1 and 8, 1894.

⁸ Rif. Med., Jan. 17, 1895.

provement was slow, it being a month before she could open her mouth sufficiently, and six weeks before recovery was complete, but the author considers the antitoxin to have prevented the spread of the trouble to other muscles.

Willard and Johnston¹ contribute an excellent review of the entire subject of "head-tetanus," with the report of a case that recovered under ordinary treatment.

Zaggl² reports 3 cases of tetanus with recovery treated by heroic doses of morphin and chloral hydrate. The first was a mild case in a girl of fourteen, the onset twenty-six days after the injury, treatment being begun at once and the drugs given by the mouth, with recovery in about two weeks. The second case was a boy six years old, the onset being three weeks after the injury and the case very severe. The remedies were given by the rectum, and apparently with some palliation, but no permanent benefit, and on the seventeenth day, the patient being in *statu quo*, a profuse roseolar eruption appeared, with rise of temperature (see report of Cuff). This frightened the parents, treatment was discontinued, and in six days the boy was well. The third case occurred in a boy of thirteen, the onset being fourteen days after the injury. Treatment was begun at once (again by the rectum) and continued for four weeks, with only slight effect on the symptoms, when, coincident with a high fever, a profuse rash appeared, medication was stopped, and the patient recovered. These were the favorable cases seen by the author, in a period of fifteen years, and he does not state how many fatal ones were seen in the same period. We might also mention that Präobrajensky³ has reported 4 cases of acute tetanus treated by inhalations of chloroform, with 3 recoveries, the fourth dying of catarrhal pneumonia on the seventeenth day. The inhalations were given from one to three times daily, the dose being from 2 to 4 drams. To these cases we add that of Hitchcock,⁴ the patient being a child aged eleven years. Violent tetanic convulsions appeared six days after the injury. The child was kept under the influence of chloroform for some hours, and then in a stupid condition for five days by large doses of chloral and bromid. For five days more these drugs were given in less, but still large, doses, and the patient made a good recovery.

Syphilis of the Nervous System.—With regard to treatment of syphilis of the nervous system we are not to be misled by statements like the following of Barbour:⁵ "Nowhere else in the whole range of therapeutics does prompt and vigorous treatment produce such wonderful effects as in syphilis of the nervous system." We may, perhaps, accept this as literally true, and yet such encouraging assertions, with reports of a few brilliant cures, often serve to plant a wrong conception in the mind of the reader. It should be remembered that these brilliant cures are nearly always of cases in their incipency, in which there is as yet scarcely any destruction of

¹ Univ. Med. Mag., June, 1895.

² Münch. med. Woch., Feb. 19, 1895.

³ Vrach ebnyia zapisky, No. 7, 1894.

⁴ Louisville Med. Jour., Jan., 1895.

⁵ Med. News, July 14, 1894.

tissue and in which the prominent symptoms are irritative in character, or of cases in which the lesion is practically confined to the envelopes of the nervous system. Softening from syphilitic disease is no more amenable to treatment than softening from any other cause; cells and fibers destroyed by syphilitic processes do not regenerate any more readily or perfectly than they do after destruction by traumatism. If, with Dr. Barbour, we are to include in syphilis of the nervous system general paralysis of the insane, tabes dorsalis, progressive bulbar paralysis, progressive muscular atrophy, and amyotrophic lateral sclerosis, we must be still more guarded in our prognosis, for there is no evidence that specific treatment has ever had a specific effect in these diseases. But we do not believe that they can be called syphilitic in the common acceptance of the word. It is doubtless true that in many cases, especially of general paresis and locomotor ataxia, syphilis does stand in some etiologic relation, but the present state of our knowledge does not enable us to define this relationship, and at present these affections must stand, clinically and pathologically, in another group. It is to be noted, however, that a distinct syphilitic process may produce a symptom-complex very like any one of these chronic degenerative diseases, and in such a case specific treatment may at times be eminently successful. [We agree with Barbour that in treatment it is best to combine the German and American methods. The German uses much mercury and little iodid; the American as a rule employs large doses of iodid, but neglects the mercury. A vigorous use of both will give the best results, not forgetting a proper care of the general health.]

Some interesting and instructive cases are detailed, of which we may mention that of a child with mental deterioration and spastic gait from inherited syphilis who improved greatly under specific treatment.

Spastic Spinal Paralysis from Hereditary Syphilis.—J. Hoffmann¹ reports a case that presented a typical picture of spastic paralysis, but with additional symptoms; there was loss of pupillary reflex and paresis of accommodation; the child was not fully developed mentally and had a bad disposition. There was a clear history of hereditary syphilis, and the author assumes the state to depend in part upon arrested development and in part upon a progressing process due to a supposititious syphilitic toxin. In any event the fact needs emphasizing that many cases of arrested development, mental and physical, as well as many infantile paralyses and convulsions, are due to congenital syphilis.

Syphilis of the Spinal Cord.—[Erb has insisted that syphilitic myelitis is slow in onset, chronic in course, of not unfavorable prognosis, and in character a sclerosis. Dejerine with equal insistence declares that it is always sudden in onset, hopeless as to recovery, and generally thrombotic in character. Ballet has taken a middle and broader ground, and along these eclectic lines are the conclusions of Lamy,² which appear to us eminently reasonable.] He mentions first syphilitic spinal meningitis without involve-

¹ Neurolog. Centralbl., 1894, p. 470.

² Archives de Neurol., Dec., 1894.

ment of the cord, which is extremely rare and the symptoms of which are largely those of irritation of nerve-roots. He emphasizes especially nocturnal rachialgia, which is quite comparable to the cephalalgia of cerebral syphilis, the frequent complication of syphilis of the base of the brain, and the comparatively good prognosis. Meningomyelitis is next divided into two stages. The first is that of irritation and of cerebrospinal symptoms, the process frequently descending from the cranial cavity (almost invariably the base) to the spinal canal. This advances with more or less rapidity to the second stage, the symptoms of which are simply those of paraplegia from transverse or partially transverse myelitis. In this stage the diagnosis is not to be made from the existing symptoms alone, but from those of the premonitory and progressive stage. Finally are considered the cases of syphilitic myelitis proper in which the cord itself is primarily affected. They are divided into the chronic, the more frequent, and which correspond to the description of Erb, and the acute, in which the onset is sudden or rapid, the destruction of tissue extensive, and the prognosis correspondingly grave. These latter are due essentially to an involvement of the nutrient arteries. Turner¹ reports a case conforming to Erb's type, and Clarke² reports 6 cases, and, as is to be expected in such a number, they do not conform to any one type, but vary as to the extent and location of the pathologic process.

Syphilitic Cord-disease from Inherited Syphilis.—Boettiger³ carefully and fully describes a case and gives an extensive bibliography. The patient was a girl of nine, whose symptoms began in the head and were so pronounced that Hitzig twice made a diagnosis of brain-tumor. Later vague spinal symptoms began; pains, slight disturbances of sensation, and increasing weakness. The postmortem examination showed syphilitic lesions of the cerebellum and most extensive meningomyelitis, quite out of proportion to the symptoms. The author particularly emphasizes the difficulty of an anatomic and pathologic diagnosis between sarcomatosis (sarcomatosis of the brain and cord), tuberculosis, and syphilis. Clinically the slowness of the process in this case (six months) indicated syphilis rather than tuberculosis.

Syphilis and Hysteria.—A. Stodart Walker⁴ calls attention to the now well-known fact that a so-called latent hysteria may be called into activity by organic disease, especially organic disease of the nervous system, and there is no doubt that many of the reported aberrant organic cases have owed their peculiar features to an unrecognized hysteria. [We agree with the author that hysterical symptoms are frequent in syphilitics, and can endorse his classification of the combinations of the two affections]: 1. Hysterical symptoms due to syphilis, occurring without symptoms pointing to gross organic disease. 2. Hysterical symptoms occurring synchronously with the appearance of the symptoms due to recognized organic disease, and disappearing on the subsidence of this disease. 3. Hysterical symptoms occurring as in the last-named cases, but persisting after the subsidence of the

¹ Lancet, May 5, 1894.

² Arch. für Psych. und Nerv., Bd. xxvi. p. 649.

³ Ibid., May 26, 1894.

⁴ Edin. Med. Jour., Oct., 1894.

organic affection or persisting in a modified form. 4. Hysteria persisting with the marked effects of the organic disease. 5. Hysterie symptoms appearing late in the progress of the disease, and either (*a*) persisting, or (*b*) disappearing, or (*c*) being modified with the subsidence of the organic disease. 6. Hysterie symptoms appearing after the apparent disappearance of the organic disease. In the paper examples are given of each of these combinations.

Syphilis as a Cause of Functional Disease.—In a logical paper abounding with clinical illustrations Kowalewsky¹ shows that hysteria, neurasthenia, chorea, and angina pectoris may be caused by syphilis, and in five ways: 1. By an alteration in the composition of the blood. 2. By an alteration of the tissues from very active antisyphilitic treatment. 3. By changes in the walls of the vessels. 4. By the nutritional change in the nervous tissue from the mental shock and depression due to a knowledge of the syphilitic infection. 5. By changes in the nervous elements due to the action of the syphilitic poison.

Acromegaly, Gigantism, Myxedema, Cretinism, Infantilism, Megalocephalus.—[Recent discoveries have emphasized the ever-trite fact that we know but little of the influences governing nutrition and the sources of their emanation. Studies of acromegaly, gigantism, and the results of thyroid therapy in myxedema, cretinism, and certain skin-diseases, as well as the records of the most multifarious trophic troubles occurring in the most various affections of the central and peripheral nervous systems, suggest vast fields of unexplored physiology and pathology. The following pages will be found of interest in this connection aside from their every-day clinical value.]

Acromegaly.—The literature of this subject is increasing at a remarkable rate, and the number of cases reported is astonishing when we consider the short time that the affection has been recognized as a clinical entity. Of recent articles that of Arnold² is one of the most complete and scholarly, and summarizes all the cases published since 1890, as well as those of pneumonic hypertrophic osteoarthropathy. His own case (already clinically described by Erb) presented neither clinically nor pathologically special features, but the remarks and conclusions of the author are worthy of mention. He calls attention to the fact that the process affects primarily the *ends* of the extremities, which become thicker both in the bone and soft parts, while the length may be much less affected; hence he would change the name to "*pachyaeria*" (thickening of extremity). The enlargement is due principally to hypertrophy of the connective tissue. He also takes exception to the most accepted hypothesis of the pathology of the affection, viz. hypertrophy or disease of the pituitary body, and believes this to be only one of the results, like the occasional hypertrophy of the thyroid and thymus glands, increase (or decrease) of perspiration, vasomotor disturbances, and obscure trophoneuroses, with degeneration of nerves, muscles, and vessels,

¹ Arch. f. Psych., Bd. xxvi. p. 552.

² Virch. Archiv, Bd. cxxxv.

particularly in the enlarged extremities. He calls attention to the combination of syringomyelia with acromegaly¹ (Recklinghausen and others), to troubles simulating acromegaly that occur in the course of tabes and the psychoses, to the similarity of this affection to the various elephantiasis² and to Marie's *osteoarthropathie hypertrophique pneumonique*. Middleton³ reports a somewhat anomalous case of acromegaly. There was enlargement of the bones of the face, of the lower lip, and of the tongue, while the other soft parts of the face were atrophic. The ears were large, with thick and almost brittle cartilages, and the ribs, clavicle, and sternum were wider and thicker than normal. There was marked atrophy of the interossei and of the thenar and hypothenar eminences. The elbows, knees, and hips were deformed, partly from enlargement of the ends of the bones, and partly from the presence in the joint of a soft, semielastic mass. It is worthy of note that there were repeated attacks of erysipelas and vasomotor disturbances, the hands and feet resembling those of a patient with Raynaud's disease. There was some improvement in the general condition after two months of treatment with thyroid. Tamburini⁴ reports a typical case with autopsy. The disease began in the twentieth year after a suppression of the menses, affecting first the lower extremities, then the head, and then the upper extremities. The postmortem revealed a tumor of the pituitary body the size of a hen's egg, the largest yet found. The thyroid was normal and the thymus wanting. Of 22 cases collected by the author, there was in 19 some change in the pituitary body, and in the remaining 3 cases either the diagnosis was uncertain or the disease was of only short duration. He concludes that the pituitary change is the essential one of the disease. Linsmayer⁵ also reports a case with autopsy in a man of sixty who had had the ordinary symptoms for twenty-five years. The pituitary body was found normal in size, but the interior was a semifluid mass—a softened adenoma. The thyroid was normal, the thymus absent, the spinal cord thick but normal, and the heart, pulmonary, and peripheral arteries greatly enlarged. Another case with postmortem examination is recorded by Baltz.⁶ A woman of forty-six entered the hospital for pain in the stomach and hematemesis, and besides marked signs of anemia she showed the stigmata of acromegaly. Especially was the inferior maxilla enlarged, the lower teeth projecting 1.5 cm. beyond the upper. The ears, tongue, lips, feet, hands, and calves were enlarged. There was slight exophthalmos. The patient died of ulcer of the stomach, and the autopsy disclosed, besides a fatty heart, distinct enlargement of the thyroid, thickening of the cranial and facial bones, widening of the sternum, and increase in thickness of the small bones of the extremities caused by hypertrophy of the outer layer, which was of an ivory-like hardness. Bramwell⁷ reports 2 cases. In 1 treatment with pituitary extract was without effect, while that

¹ See "Chiromegaly."

² Glasgow Med. Jour., June, 1894.

³ Wien. klin. Woch., 1894, No. 14.

⁴ See "Megaloccephalie."

⁵ Centralbl. f. Nerv. u. Psych., Dec., 1894.

⁶ Jahrb. der Hamburger Staatskrank., iii.

⁷ Brit. Med. Jour., Jan. 6, 1894.

with thyroid produced considerable improvement. In the other case just the reverse held good. Murray¹ reports 2 typical cases. In the first the disease began six months after an exposure to coal-gas sufficiently grave to cause unconsciousness for six hours. (Compare "Arthropathies," case of Billings.) Treatment with thyroid had little or no effect. In the second case the pituitary body was found at the autopsy to be considerably hypertrophied. The case of Moyer,² which was typical in its clinical picture, had a squint and optic atrophy of the right eye and amblyopia of the left, which



FIG. 4.

would point to the pituitary body as the seat of a new growth or hypertrophy. Quite similar is the interesting case of Pershing.³ (See Plate XVI.)

¹ Brit. Med. Jour., Feb. 9, 1895.

² Internat. Med. Mag., Feb., 1894.

³ Ibid., June, 1894.

The enlargement of the face and extremities was characteristic, and the cerebral and ocular symptoms pointed to the pituitary body as the seat of the lesion. Unverricht¹ reports very fully a case in which the eye-symptoms—binasal hemiopia, amblyopia, and optic atrophy, indicated a pituitary growth. J. Lynn Thomas² reports a case that also points to the pituitary body. The patient was blind in the right eye, hemiopic (temporal) in the left, and this hemiopia was shown to be due to a lesion in front of the corpora quadrigemina by the presence of Wernicke's sign; that is, the pupil did not respond to light thrown upon the blind half of the retina. Ransom³ reports 2 cases, both showing bitemporal hemianopia and both treated by pituitary tabloids without effect.

Figure 4, A, B, C, is taken from the excellent article on this subject by Souques in the *Traité de Médecine* of Charcot, Bouchard, and Brissaud, Paris, 1894, vol. vi. p. 965.

Gigantism and Acromegaly.—Brissaud and Meige⁴ had a case, a male of forty-seven, who presented nothing unusual before the age of sixteen, when he began rapidly to become larger, until, having reached his majority, he measured 7 feet 2 inches in height and weighed about 340 pounds. He remained well and very strong until the age of thirty-seven, when he over-lifted, and following this he developed an extreme deformity of the spine and trunk, the latter "telescoping into itself" until the nipples were on a level with the anterior superior spines of the ileum. For two years he had suffered with debility, fatigue, bronchitis, night-sweats, headaches, and great thirst. Mentally he was dull; the bones of the face and extremities showed the hypertrophy characteristic of acromegaly, the soft parts not being involved. The circumference of the trunk at the nipples was 62 inches, and over the most prominent part of the kyphosis and pigeon-breast 74 inches. The authors agree with Dana and others that there is an intimate relation between acromegaly and gigantism, but they go farther and compare both to the natural growth of the body. They call attention to the striking resemblance to acromegaly of the disproportionate growth of the boy at adolescence, which corresponds so well to Marie's terse description of this disease: "The disease manifests itself by preference in the bones of the extremities and in the extremities of the bones;" and conclude with this rather striking and aphoristic proposition: "Acromegaly is gigantism of the adult; gigantism is acromegaly of the adolescent."

Chiromegaly.—This term has been applied by Charcot and Brissaud to the pseudoacromegaly that sometimes occurs in syringomyelia. Most of the cases that have been reported as a combination of these two diseases are now thought to be only syringomyelia. A recent case is reported by M. Marie in *L'Union médicale*. In this connection it is of interest to notice a case of what might be called acute symptomatic transitory pseudoacromegaly reported

¹ Münch. med. Woch., Apr. 2, 1895.

² Brit. Med. Jour., June 1, 1895.

³ Ibid., June 8, 1895.

⁴ Jour. de Méd. et de Chir. prat., Jan. 25, 1895.

PLATE XVI.



FIG. 1.—Mrs. A. B., aged twenty years, showing normal appearance of the patient.



FIG. 2.—Same patient, aged forty-two years, affected with aerophagia.
(Intern. Med. Mag., June, 1904.)

by Potovski.¹ In an insane woman and without ascertainable cause there appeared an enlargement of the ankles, wrists, and shoulders, later of the muscles, with superficial trophic disturbances that gradually disappeared. The author excludes syphilis, tuberculosis, rheumatism, gout, hemophilia, etc., and considers it to have been a trophic affection of cerebral origin. A supposed syphilitic case is reported in the *Revue de Médecine* for April, 1893. There was thickening of the fingers, toes, wrists, and ankles. Although the author thinks the affection syphilitic, there was also a pulmonary complication, so the pneumonic osteoarthropathy of Marie was scarcely to be excluded. Cases of the latter affection simulating acromegaly have been reported by Korn² and Murray.³

Megalocephalie or Leontiasis Ossea.—[The second of the above designations was given by Virchow to a diffuse hyperostosis of the cranium, about 6 examples of which are to be seen in the various European museums. From a further study of the specimens Baumgarten concludes that part of them, those in which only the facial bones are enlarged, come from cases of acromegaly, and that the term *leontiasis ossea* must be limited to those in which the cranial bones are also affected. No case had been recorded clinically.]

Starr⁴ describes what he supposes to be a case of this disease, and proposes the title *megalocephalie* as preferable to the other, because the soft parts are also included in the hypertrophic process. A female, æt. fifty-two, married, no children, of negative heredity, six years before showed the first symptoms of the affection, which began with formication in the finger-tips. This gradually extended to the shoulders, and was attended with some uncertainty of tactile sense and some clumsiness of movement, but actual anesthesia has never been demonstrated. The numbness had not invaded the trunk or lower extremities, but there was slight uncertainty in the gait. There has been a slowly progressing enlargement of the head, face, and neck, affecting the bone, skin, and subcutaneous tissue, the first to the greatest degree. The circumference of the neck was 16 inches; the horizontal circumference of the head was 24 inches; from ear to ear over the vertex 15 inches, and from the root of the nose to the occipital protuberance 16 inches. The cervical vertebrae were involved, and she had lost 5 inches in height.⁵ The tongue was normal, and there was no apparent swelling of the thyroid gland. The administration of thyroid as well as other therapeutic methods were without effect.

Thyroid Treatment of Sporadic Cretinism.—Bramwell⁶ regards sporadic cretinism as an infantile form of myxedema, and accordingly expected the good results which he has obtained from the administration of thyroid glands or a thyroid extract. Telford Smith and Realton each report 1 case

¹ *Nouv. Icon. de la Salpêtr.*, No. 6, 1893.

³ *Id.*, Feb. 9, 1895.

⁵ Brissaud and Meige notice the same thing much more pronounced (more than 15 inches) in a case of gigantism (q. v.).

² *Brit. Med. Jour.*, Dec. 2, 1893.

⁴ *Am. Jour. Med. Sci.*, Dec., 1894.

⁶ *Brit. Med. Jour.*, No. 1723, 1894.

of sporadic cretinism treated by thyroids. The patients were children and brothers, and the results of treatment excellent. Realton's case grew 4 in. in a year, while the preceding year he had grown only $\frac{3}{4}$ in. The case of Anson¹ is very similar. A girl of ten after a year's treatment had improved wonderfully physically and mentally. Sinkler² reports the case of a child of three, a marked cretin who could not walk alone nor talk, was apparently deaf, was myxedematous, and rachitic. She grew worse on cod-liver oil and general treatment for a number of months, and was then put on thyroid, and at the end of four months there was marked improvement (Plate XVII., Figs. 1, 2, 3, and 4). Cray³ treated a cretin of five years, who was about the size of a ten-months' infant, with thyroid, and after six weeks could report marked improvement. Brissaud and Souques⁴ treated a case of strumipriva (operative myxedema) with sheep-thyroids, and at the end of four weeks, the patient, having taken 15 glands, was almost well and still improving.

Myxedema, Cretinism, and Infantilism.—Brissaud⁵ in a most interesting lecture shows the intimate relation between myxedema, endemic cretinism, sporadic cretinism or myxedematous idiocy, and infantilism. He considers that they all depend on an inherited or acquired deficiency or disease of the thyroid gland, and presents cases illustrating each affection. Figure 5 is from a case of acquired myxedema, a woman of sixty-four years. Figure 6 represents the same patient after a course of thyroid-treatment, which removed most of the myxedematous symptoms, but had no effect on the cachexia, and she died soon after the cessation of treat-



FIG. 5.



FIG. 6.

ment. The author therefore enjoins caution in the treatment of old and cachectic cases. Figure 7 is from a marked case of myxedematous idiocy (sporadic cretinism). The patient was twenty-four years old. Figures 8

¹ Lancet, No. 3687, 1894.

² Internat. Med. Mag., Dec., 1894.

³ Am. Jour. Med. Sci., May, 1894.

⁴ Arch. de Neurol., Oct., 1894.

⁵ Leçons sur les Mal. nerv., p. 606, Paris, 1895.



Sporadic Cretinism, and its Treatment by Thyroid Extract.

FIG. 1.—Isabella Metc. Sporadic cretinism.
Before thyroid feeding.

FIG. 2.—Isabella Metc. Sporadic cretinism.
Before thyroid feeding.

FIG. 3.—Isabella Metc. Sporadic cretinism.
After thyroid feeding.

FIG. 4.—Isabella Metc. Sporadic cretinism.
After thyroid feeding.

(Internat. Med. Mag., Dec., 1894.)

and 9 are taken from a case of myxedematous idiocy, or rather imbecility,

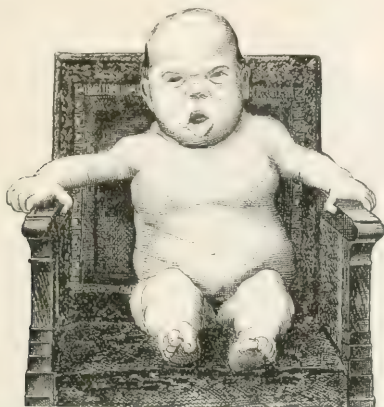


FIG. 7.

before and after a six weeks' course of thyroid-feeding. The patient was thirty-seven years of age, and the result, as seen, was striking. Figure 10



FIG. 8.



FIG. 9.

shows a case of myxedema, one of myxedema in a case of arrested development—a transition case between myxedema of the adult and sporadic cre-

tinism—and a typical case of this latter affection. Figures 11 and 12 are



FIG. 10.



FIG. 11.

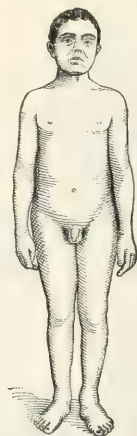


FIG. 12.

from a case of infantilism—a young man of eighteen who has the appearance of a boy of ten or twelve.

The Thyroid Treatment of Tetany.—Bramwell¹ reports a case of tetany

¹ Brit. Med. Jour., June 1, 1895.

due to extirpation of the thyroid cured by large doses of thyroid gland, and also a case of idiopathic tetany in a boy of nine years cured by the same treatment.

Hereditary Lead-palsy.—[In addition to a neurotic heredity, we must now recognize a toxicopathic heredity. This has long been acknowledged for alcohol, the children of alcoholics being prone to various nervous affections, and this hereditary influence may even manifest itself as a multiple neuritis identical in every way with alcoholic neuritis. The hereditary influence of lead, first emphasized by Berger, has been elucidated by Eulenburg, and especially by Oppenheim, who is, moreover, the inspiration of Anker's report. It has been shown that children of the subjects of lead-poison are not only peculiarly prone to be attacked by various neuroses and psychoses, but also show a pathologic susceptibility to the influence of lead, contracting lead-palsy and lead-colic with remarkable facility; but up to the present time there has been no report of a "typical lead-paralysis" from hereditary influence alone, without any contact with the poisonous metal.] Such a case, however, Anker¹ claims to present. The patient was a child of eight years, daughter of a typesetter who had repeatedly suffered from lead-colic. He denied syphilis, but his wife had had three miscarriages. The child at the age of three years had a fall upon the back of the head that seemed to cause an arrest of mental development, as she remained much in arrears of those of her age, and speech developed very imperfectly. At seven she began to show weakness in the legs, which slowly increased to paralysis. On examination she was found to be mentally very deficient and dolichocephalic; there was fibrillary tremor of the facial muscles, paralytic *pes equinovarus* on both sides, and some resistance to passive motion at the knee, with exaggerated knee-jerks and patellar clonus; the Achilles jerk was normal, but the tendon-reflexes of the upper extremities were exaggerated. Dorsal flexion of the feet was almost lost, and there was partial reaction of degeneration in the paralytic muscles. Plantar flexion was normal. The eyes and arms were normal, and probably sensation also. The bladder had to be emptied promptly on desire to urinate. In six months more the paralysis below the knee had become complete, and the forearms and shoulders were also involved, with atrophy and reaction of degeneration, but the triceps and supinator longus were intact. At the time of the next examination, four months later, the arms and hands had begun to improve notably, but the legs remained the same. At the first examination the atrophic paresis of the legs with exaggerated reflexes, the mental weakness and bladder-trouble, led to the provisional diagnosis of cerebrospinal syphilis, but six months later the distribution of the paralysis was so typical of lead that careful inquiries were instituted as to a possible source of poisoning. Not the slightest evidence of direct intoxication could be found; there was no lead-line on the gums, and not a trace of lead in the urine. The author to his own satisfaction excludes multiple neuritis and acute and subacute anterior poliomyelitis, and

¹ Berlin. klin. Woch., June 18, 1894.

makes a diagnosis of hereditary lead-paralysis without indicating the pathologic process or localization.

[Even supposing this paralysis and its distribution to be due to lead-intoxication in the parent, a question might be raised as to the propriety of calling it "lead-paralysis," but, aside from this, it would seem incumbent upon the author in making his diagnosis to exclude more conclusively than he has done a syphilitic affection (the first diagnosis indeed), as well as neuritis and infantile paralysis. The case, however, is a valuable contribution to a new and incomplete subject, and worthy of careful consideration.]

MISCELLANEOUS NERVOUS AFFECTIONS.

Insomnia.—Claus¹ finds trional an excellent remedy for the sleeplessness of all functional affections, especially chorea and convulsions. He finds it useless in cases in which the insomnia is due to pain or to organic disease, as in meningitis. He also recommends it for night-terrors. The dose is from 3 to 6 gr. for children under a year, from 16 to 22 gr. for children between six and ten. [These seem to be rather large doses.] Ziemssen² recommends lactophenin in doses of from gr. 15 to 22 as an efficient hypnotic. The drug is really a lactophenacetin, and is also commended by von Jakseh and Jaquet. Chloralose as a hypnotic seems to give very good satisfaction.³

Craniotomoscopy.—This is a method of examining the cranium and its contents by means of sound.⁴ Murawjeff has devised an electric "tonoscope," but for ordinary use a tuning-fork and stethoscope will suffice. The stethoscope is placed in the middle line (say on the forehead), and the conduction of the sound of the tuning-fork through the cranium is compared from corresponding points on the two sides, or the tuning-fork is placed on the middle line and the observer listens over different points. Instead of the tuning-fork, percussion with a hammer or the finger may be employed, but is less satisfactory. [As to the practical value of the method, no positive statements can be made until after more extensive trial. Bechterew believes that it is important, and claims to have located foci of disease in the brain. Murawjeff, whose investigations were much more extensive, says that the method is of little value in brain-lesions, even tumors, but is of assistance in locating affections of the cranial bones and of the membranes. There is little doubt that it is of use in deciding on the presence of pus in the mastoid. The transmission of sound from or to—that is, through—the affected locality is defective, the note being duller and less distinctly heard.]⁵

Electricity as an Agent in Diagnosis and Prognosis.—Opinions as to the value of electricity as a diagnostic and prognostic aid vary considerably, but the following conclusions of Leszynsky⁶ were very generally concurred in by the members of the New York Neurological Society, and may be said to

¹ Internat. klin. Rundsch., No. 45, 1894.

² Münch. med. Woch., Dec. 11, 1894.

³ See The Practitioner, No. 313, 1894.

⁴ V. Bechterew: Neurolog. Centralbl., 1894, p. 513; Murawjeff: *ibid.*, p. 586.

⁵ Deutsche Zeit. für Nerv., Bd. vi. p. 93, 1894.

⁶ Med. Rec., Aug. 18, 1894.

fairly represent the present opinions of the best observers. [With but few exceptions we can agree to them]: 1. The value of electricity as an accessory method in diagnosis and prognosis of disease of the peripheral nerves is not so universally recognized as its importance demands. 2. The result of this procedure often furnishes corroborative and conclusive evidence when only a provisional diagnosis has been made. 3. The necessary technical skill in successfully pursuing such investigation and correctly interpreting the result can only be acquired through special study and practice. 4. The use of the faradic current alone is quite sufficient for diagnostic purposes. 5. As a rule the galvanic current is supplemental to that of faradism, and in the absence of faradic irritability in nerve and muscle it is of the greatest service in prognosis. 6. The discovery of the reaction of degeneration is not an essential feature in the differential diagnosis as to the location of the lesion. 7. The peripheral nerve-fibers possess an inherent power of regeneration, which seems almost unlimited, the length of time required for the completion of the regenerative process varying from a few weeks to seven years or more. Therefore in severe forms of injury the cause, degree, and character of the damage to the nerve are often of greater importance in prognosis than the demonstration of the reaction of degeneration. 8. The presence of R. D. or partial R. D. is not incompatible with the preservation of motility in the same area. This paradoxical condition has been found in cases of lead-poisoning and a few others, but thus far the cause has been inexplicable. 9. Strong currents are only rarely necessary. The weakest current that will produce a distinctly perceptible reaction is all that is requisite. 10. A decrease or disappearance of faradic irritability in nerve and muscle simply denotes an interference with the nutrition in the course of the motor tract between the multipolar cells in the anterior horn and the peripheral nerve-distribution. It does not enable us to judge of the nature of the pathologic process. 11. The character of the reactions does not differ whether the lesion be situated in the cells of the anterior horn, the anterior nerve-roots, the nerve-trunks, or in their ultimate distribution. The same rule holds good in reference to the various cranial motor nerves and their nuclei, such as the facial, hypoglossal, and spinal accessory nerves. 12. When the faradomuscular irritability is lost no reaction can be obtained by a rapidly-interrupted galvanic current. 13. The secondary current from an induction coil is that generally used in testing faradic irritability. Owing to its high electromotive force the resistance encountered in the moistened skin may be considered negligible. 14. The difference in the poles of the faradic current is only a relative one, and cannot be determined by the usual tests as applied to the galvanic current. The electromotive force in the secondary coil is greater at the "break" than at the "make." The electrode that is felt to be the stronger in its action is usually considered as the negative, or so-called "faradic cathode." 15. In some apparently healthy individuals the musculospiral nerve fails to react to strong currents applied with the "faradic anode," while a comparatively weak current from the "faradic cathode"

calls forth a quick response. 16. In a case of undoubted peripheral paralysis the faradic irritability may be preserved, but it almost invariably requires a stronger current to produce muscular contractions than upon the healthy side (quantitative decrease). I have never seen a case in which this could not be demonstrated within a few days after the onset of the paralysis. 17. The character of the muscular reaction demands attention. A slow and labored contraction associated with decrease in faradic irritability denotes degenerative changes. 18. The faradic irritability may return in persistent cases of peripheral paralysis without any perceptible improvement in motility. 19. Electric diagnosis is inapplicable in paralysis of the ocular muscles.

Motor Paralysis from Cold.—Dr. Rich¹ describes a remarkable family-affection that he traces back through five generations and which has affected 22 persons, of whom 14 are now living. The peculiar feature of the disease is that in persons afflicted with it any muscle or group of muscles exposed to cold, especially damp cold, becomes fixed in the position in which it happens to be, whether in a state of contraction or relaxation, and remains so until heat is applied. The cold need not be intense, and Rich instances the case of a younger member of the family who, after dancing vigorously, went to sleep in her underclothing, which was damp with perspiration, and awoke after a time quite chilled and unable to move or cry out on account of the rigidity of the entire muscular system. The trouble is purely motor, there being no change in sensation, subjective or objective. There is no change in color of the part, and no sequels except at times a slight edema and limpness of the members. The author very properly excludes tetany, Thomsen's disease, and Raynaud's disease, and the affection is probably unique.

Periodic Fluctuations in the Functions of the Cerebral Cortex.—The intermittent appearance of symptoms of irritation, sensory and motor (pain, spasm), is no rarity, but Stern's two cases² show the opposite, an intermittent diminution in acuity of all kinds of sensation, including the special senses, with paresis and ataxia of all voluntary muscles and a decrease of intellectual capacity. Both were cases of accidental head-injury, and displayed the ordinary symptoms of the so-called traumatic neuroses. The described attacks were almost identical except in degree and in the duration of the oscillations, in the one the free intervals lasting from two to forty-four seconds, the attacks from three to twenty-nine seconds; in the other the duration for either being from two to six seconds. The first patient had symptoms of an injury to the motor cortex of the left hemisphere, right hemiparesis with slight anesthesia, and later attacks of cortical epilepsy, and the symptoms of his peculiar functional trouble were at first confined to this side. The second patient had at times a twitching of certain muscles of the face, arms, and trunk, but in neither case did these motor troubles show any relation to the fluctuations in functional activity.

During the "negative oscillation" in the more pronounced of the two cases there was almost entire loss of pain-sense, and that for touch, tempera-

¹ Med. News, Aug. 25, 1894.

² Berlin. klin. Woch., Dec. 3, 1894.

ture, and position was greatly diminished. At the same time the patient became almost blind and partially deaf; the superficial reflexes (skin and mucous membrane) were abolished, but the pupillary and deep reflexes were unaffected. Marked paresis and ataxia of all voluntary muscles were easily demonstrated, and the mental faculties (memory, speech, etc.) were impaired. All these symptoms disappeared, as they had appeared, in an instant, to recur a few seconds later. Both cases were observed for months, and simulation was certainly excluded. Of the nature and etiology of the affection the author attempts no explanation, but asserts that it must be functional and its location the cerebral cortex, and that it is not a phenomenon of exhaustion. No changes in the retinal circulation could be detected. [These cases seem to be unique, but others in the literature make it probable that similar symptoms limited to one sense or faculty have been observed.]

Periodic Family-paralysis.—Ten years ago Westphal¹ described the first of these rare and very strange cases, of which that of Hirsch² seems to be a typical example. A man twenty-six years old, of previous good health, with neither nervous heredity nor disposition, began six or seven years before the date of observation to have attacks of weakness in all four extremities, so that he could not work and was obliged to go to bed. These attacks recurred without apparent cause about once a year, lasted only twenty-four hours or less, and left not the slightest symptom behind. One year before, the paralysis became for the first time complete, arms, legs, and trunk being absolutely paralyzed, but the face as usual quite free. The trouble as before, lasted only twenty-four hours, and as before disappeared suddenly. The attack observed by the author was similar in every way, except that it began in the lower extremities instead of the arms, as heretofore. Within twenty-four hours there was total paralysis of the trunk except the abdominal muscles, and of all the extremities, the face and sensorium being unaffected. There was no fever, the pulse was 78 and regular, the urine normal, and there was no pain or paresthesia, but there was great thirst. Sensation was perfectly normal, the sphincters were intact, but all superficial and deep reflexes, with the exception of the abdominal reflexes, corresponding to the intact abdominal muscles, were abolished. No electric examination was made, but in other recorded cases the electric reaction to both currents was lost or greatly diminished. The cardiac dulness reached to the right sternal border; the first heart-sound was not clear, and was accompanied by a murmur. The paralysis was flaccid and the ideomuscular irritability was greatly diminished. At six o'clock on the evening of the second day the patient could make very slight rotary movements of the head, before impossible, his condition otherwise remaining the same. At eleven o'clock he suddenly awoke to find that motion was perfect throughout, and this was confirmed by the examination the following morning, not the slightest weakness being discoverable. Furthermore, the reflexes had returned and the cardiac dulness extended only to the left border of the sternum. After leaving the hospital

¹ Berlin. klin. Woch., Nos. 31 and 32, 1885.

² Deutsch. med. Woch., Aug. 9, 1894.

the patient had a number of slight attacks, which he attributed to hot drinks (grog or tea) taken the previous evening. The mother of the patient was said to have had similar attacks, and the family type of the affection has been noted before.¹ [Westphal's case also showed enlargement of the heart with mitral regurgitation during the attack. The nature of the affection is still entirely in the dark, the most plausible theory being that it is an auto-intoxication, and Bernhardt has suggested that the virus generated may be somewhat similar to curare. Every theory thus far offered, however, fails to explain all the symptoms, especially the sudden loss and equally sudden restoration of the electric excitability.]

Functional Ophthalmoplegia.—Suckling² describes what he supposes to be a new functional disease, but which he believes to be related to exophthalmic goiter. It affects chiefly young women, and is characterized by ophthalmoplegia, with hemiplegia, general weakness, dysphagia, and dysarthria. In his cases most of the other cranial nerves, the third, the motor branch of the fifth, the seventh, spinal accessory and hypoglossal, were more or less implicated.

Vascular Spasm with Acute Dilatation of the Heart.—J. Jacob³ describes a functional affection of which he has seen several examples, the most prominent symptoms of which are a sudden spasm of the peripheral vessels, with a chill and sometimes pain, precordial distress, dyspnea, cold skin, and very rapid or very slow pulse. At the same time there is acute dilatation of the heart, the area of dulness being increased and the apex-beat displaced. This persists several weeks, or may continue indefinitely if the attacks are recurrent. The best treatment is the hypodermic injection of full doses of morphia.

Myasthenia Gravis Pseudoparalytica.—With the foregoing affections it seems rational to group the following case recorded by Jolly:⁴ A schoolboy fourteen and a half years old was always well until the age of thirteen, when the present trouble began with a difficulty in looking at the blackboard because of an inability to hold his eyes open for any considerable length of time. The weakness next affected the legs, but was noticed only after exertion. A few months later the arms became affected, and then the muscles of the neck, the muscles of mastication, and the lips; the tongue and muscles of deglutition remained intact. The disability in all these regions was manifest only after exertion. After a period of rest he could walk normally, use the arms freely, masticate vigorously, talk and whistle easily, but after a few minutes of exercise of any muscular group it rapidly became paretic, almost paralytic, so that mastication would cease for want of power, articulation would be very imperfect, or the hand could not be raised to the horizontal, as the case might be. Moreover, exertion of one functional group caused some weakness in the others. The electric examination

¹ Cousot, Goldflam : Wien. med. Presse, Nos. 36 and 39, 1890.

² Brit. Med. Jour., March 25, 1894.

³ Med. Week, iii. p. 83, 1895.

⁴ Berlin. klin. Woch., Jan. 7, 1895.

revealed quite an analogous state of affairs. The reaction to either current, at first normal, rapidly diminished in intensity, with continuation of the stimulus, until it almost disappeared. That this analogy was to be referred to the same condition was evidenced by the fact that voluntary exertion, causing paresis of voluntary motion, also diminished the electric reaction, and *vice versa*. The knee-jerks were normal, but, unfortunately, it is not stated whether or not there was any change during the paretic period. Sensation, the special senses, superficial and deep reflexes, the eye-grounds, and internal organs were normal. The author considers the whole symptom-complex to be a phenomenon of exhaustion, but does not venture to definitely locate the seat of the trouble. He thinks it possible that in different cases it may have a different location—the upper part of the motor tract (cerebral cortex, etc.), the medulla and cord, or the muscular tissue itself. This affection is contrasted with Thomsen's disease, and it is recalled that as there are drugs which can produce a condition similar to the latter disease (physostigmin, digitoxin, veratrin), so there is one (protoveratrin) the effects of which simulate the former. The author has once before observed a case similar in every way to the one here recorded, the patient dying suddenly while eating from impaction of the alimentary bolus in the esophagus, and he has collected 17 cases more or less resembling it. In the treatment the patient is to strictly eschew every exertion, the utmost quiet is to be observed, and faradism is to be avoided. Central galvanization, recommended by Erb and Goldflam, is of doubtful utility. The nutrition of the patient is to be carefully attended to, but the esophageal tube is not to be used, because the pharyngeal spasm excited thereby seems only to aggravate the affection. Nutrient enemata are to be preferred.

Congenital Ptosis with Associated Movements.—Bernhardt's¹ case was of a young man of nineteen who had a congenital ptosis of the right eye, which he was absolutely unable to open, although opening the mouth widely or pushing the lower jaw to the left caused the lid to rise. The nervous system was otherwise entirely normal. Bernhardt has succeeded in collecting 24 cases which for the most part closely resemble his own, but the ptosis may first appear some years after birth, and the associated movement may gradually disappear. In 2 cases the affected lid could be raised only when the other eye was closed. [We have observed this same phenomenon in a middle-aged man (ptosis not congenital), but this case was supposed to be of psychic or hysterical origin. We have also seen such a case as Bernhardt describes in which the ptosis had been somewhat alleviated by a lid-operation.]

BRAIN-DISEASES.

Diffuse Sarcomatosis of the Brain and Spinal Cord.—[This is a very rare affection, only 10 cases having been reported, but the possibility of its occurrence is of importance, because it may present a most striking resem-

¹ Neurolog. Centralbl., p. 325, 1894.

blance to syphilitic or tubercular meningomyelitis.] The recent case of A. Westphal¹ illustrates this clinical similarity excellently well, and also explains it, as the postmortem findings were scarcely to be distinguished from those of the two diseases just mentioned. (See Syphilitic Cord-disease.)

Tumor of the Pons and Medulla.—A case of tumor (glioma) reported by Jolly² well illustrates how extensively the most vital part of the nervous system may be involved without alarming symptoms. The growth extended from the upper part of the hypoglossus nucleus to the corpora quadrigemina on one side and from the level of the seventh nerve to the same upper limit on the other. The history covered two years, and yet, until just before death, the symptoms were not striking. There was left facial paralysis and slight anesthesia, paresthesia, and weakness of the right arm, and to an even less extent of the right leg, conjugate deviation of the eyes to the right, and some difficulty in deglutition. There was no deafness in the left ear (the side of the facial palsy) and no choked disk.

Tumors of the Brain not Diagnosed.—Burnet's³ first case was diagnosed as one of alcoholic insanity. There were hallucinations of sight and hearing and delusions of grandeur. The autopsy revealed multiple gummata of the brain. The second was diagnosed as senile dementia. The post-mortem examination discovered a large tumor of the base of the brain connected with the pituitary body. [It would seem to us that in both these cases the diagnosis of tumor might have been made had the patients been properly examined. For instance, there were eye-symptoms in both cases, and yet the eye-grounds were never inspected.]

Nonoperative Treatment of Brain-tumors.—Diller⁴ makes a plea for the expectant and medical treatment, but in only one of the cases adduced in support of this advice was the tumor diagnosed and located; that is, in only one case was there any choice in the matter, and this patient died within a year.

Simple Subcortical Cyst—Operation—Recovery.—Rossolimo⁵ reports the case of a man of thirty-eight who gave a history of the present trouble, going back about six years, when it began with a change in disposition, a cold feeling in the hands, especially the left, and short attacks of unconsciousness; later there were convulsions and an inability to find words; and then increasing weakness of the left side, especially the hand, with cyanosis and edema of the latter, were added. All the symptoms were in a marked degree variable. At one time he was unable to get out of bed, but after this he improved and was able to go about. A lesion was located in the right frontal lobe just in front of the arm-center, and operation revealed a cyst holding about two drams of fluid, which was evacuated and drained. The patient showed immediate improvement, and the ultimate result (two and a

¹ Arch. für Psych. und Nerv., Bd. xxvi. S. 770.

² Ibid., S. 619.

³ Jour. Am. Med. Assoc., Aug. 18, 1894.

⁴ Univ. Med. Mag., Aug., 1894.

⁵ Deut. Zeit. für Nerv., Bd. vi. S. 76.

half months) was eminently satisfactory, but a slight amnesic aphasia remained, with some hypochondria and headache, and slight sensitiveness of the left hand to cold. The points of special interest are—the long and varying course with predominating psychic symptoms, the vasomotor and temperature-changes in the left (paretic) extremity, the occurrence of aphasia from a right-sided lesion (the patient was right-handed), and the ability the patient had for many months to cut short the epileptic attacks by pressing the hands firmly together. Of surgical interest is the fact that the lesion was entirely subcortical, and was only found by passing a scalpel into the substance of the brain.

The Differential Diagnosis of Brain-tumors.—Victor Horsley¹ presents a most excellent paper of which we give the principal points: The differential diagnosis of acute abscess of the brain from tumor should never give rise to difficulties, but a chronic abscess may in all essentials so closely resemble the latter as to make a positive conclusion impossible. This, however, is not of so much moment as might appear, because the skull must be opened for the relief of either condition. In this connection it is well to remember, as pointed out years ago by Dr. Wilkes, that in subacute abscess the temperature, far from being elevated, is generally subnormal. Uremic poisoning may closely simulate brain-tumor, but a careful examination of the urine will obviate mistake. Careful observation has shown that in the majority of cases choked disk, when present, is more marked on the same side as the lesion, although sometimes, as taught by Hughlings-Jackson, the reverse holds good. Simple anemia may cause typical choked disk, besides most of the other more prominent systems of tumor, and a case in point is reported. [This is a most pertinent warning to the clinician. The writer has now such a case under observation, and knows of several others.] Diffuse headache is, as a rule, an earlier symptom than the localized form, and may be either constant or paroxysmal, the latter being the more common. Localized tenderness is better determined by pressure with the thumb than by percussion. "Of all the initial symptoms of cerebral tumor, the epileptic convulsion is the most important, not only because it is a clear indication, but also because tumors causing the most characteristic forms of epilepsy are the more easily removed. The convulsion may be—1. General, and so simulate idiopathic epilepsy; 2. Generalized, but preceded by a localized aura; 3. Though generalized, also commenced by localized muscular spasms; 4. A typical Jacksonian fit, becoming in some cases more generalized, and in some followed by a certain degree of paralysis; or, 5. It may evince itself by single spasms, not grouped as in a complete fit." The characters of the fit in relation to the localization are as follows: "Lesions of the frontal lobe appear to produce convulsions of the generalized type, and, above all, as Dr. Jackson has often pointed out, convulsions in which movements of a half-purposeive character are very prone to be exhibited;" and in the fit the focus that commences the disturbance is that for the turn-

¹ Clin. Jour., Feb. 13, 1895.

ing of the head and eyes to the opposite side, because, of the various centers, it is situated farthest forward, and the progress of the disease is from before backward. The parietal lobe includes a large proportion of the most important motor centers, and the commonest form of convulsion due to lesion in this region is typical Jacksonian epilepsy. In this connection the author exhibited the brain of a patient from whom he had removed a tumor eight years before, and it simply showed a small depressed scar, strictly limited to the field of operation and at the inferior genu of the fissure of Rolando, exactly in accordance with the localization made at the time of the operation. Tumors of the parietooccipital region will probably be characterized by general convulsions, with ocular deviation and visual auræ. "Tumors of the occipital lobe most commonly present generalized convulsions, hemianopsia from destruction of the cuneal region, and are not infrequently accompanied by so-called hysteric manifestations. Hemianopsia, it is to be noted, is also a frequent, and in fact usual, accompaniment of tumors of the parietooccipital region, when the lesion burrows deeply and so affects the optic radiations. Finally, in the case of tumors exciting epilepsy from the occipital lobe it is to be remembered that, owing to vertical pressure on the tentorium, they may also give rise to symptoms resembling closely those of cerebellar growth; for example, nystagmus, tottering, etc. Epileptic convulsions from lesions of the temporal lobe have been observed in cases of gross organic disease (published by Dr. Thomas Wilson and others), and are preceded by a sensory aura of the auditory type, also by the occurrence of amnesia; and, further, when paresis follows it is apt to be of a graduated type from the pressure on pyramidal fibers and areas of motor representation in the cortex. Those cases of tumor of the inner surface of the temporal lobe which have been carefully observed are extremely interesting, for they have shown that the epileptic convulsion is characterized by the occurrence of hallucinations of smell and taste, the special-sense areas of representation of these functions having originally been demonstrated by Dr. Ferrier to be situated in this region. "It should be noted that, whatever be the nature of the fits in the subsequent progress of the case, the initial attack is very often a generalized one. Moreover, in a certain number of instances the attacks are sometimes localized and sometimes generalized in the same case. The largest tumor I ever removed (the case of a lady operated upon six months ago, she being still in good health and recovering from the paresis) was treated for more than nine years as one of idiopathic generalized epilepsy, and that even at a time when the growth was already penetrating the skull. A careful analysis and observation of the fits would have shown that many of them were characteristically unilateral. The larger and more deeply seated the growth, the more generalized are the convulsions. There is frequently present in cerebral tumor a general muscular weakness, which has often been confounded with simple neurasthenia, and has sometimes led to a mistaken diagnosis of hysteria; cases of this kind have from time to time been reported." It is also likely that many tumors for a long time run a latent

or masked course, and only later assume a more malignant character. Localized paralysis may arise from direct destruction or pressure upon the so-called motor or excitable frontoparietal cortex, or by pressure transmitted indirectly to the same part from a lesion situated at a distance; that is, in some other lobe. In the cases of such indirect interference the situation and degree of the paralysis are precisely dependent upon the situation and size of the growth.

The author again insists upon the fact that in extremely limited lesions of definite spots in the so-called "motor" region in man there is to a certain degree tactile anesthesia, but chiefly a loss of muscular sense, and that the paralysis of sensation is proportional to the destruction of the cortex. The deep reflexes may be exaggerated on the opposite side of the body in cases of destructive cerebral lesion, and on the same side in cases of cerebellar disease, as has been recently established beyond doubt by the very complete researches of Dr. Risien Russell. Apropos of focal fits from transmitted pressure, the author reports the case of a young boy who had all the symptoms of a tumor of the parietal lobe—namely, stupor, headache, vomiting, hemiplegia, intense optic neuritis, and apparently Jacksonian epileptic fits becoming generalized. An operation with very thorough exploration discovered no tumor, the bulging of the brain proving, however, that a deeply-seated tumor existed within the skull. The wound was closed, and, in accordance with the author's previously published results, the release of the pressure caused arrest of the growth and probably its complete atrophy, for all the symptoms described disappeared, and the boy is now apparently perfectly well except for a slight clumsiness in the hand. There is one thing in common to all the multifarious symptoms of brain-tumor, and that is that, unless masked by treatment, they are steadily progressive, and observation of their steady extension should always be looked upon as the most pathognomonic sign possible.

The author still adheres to his dictum of six years ago, that all cases of Jacksonian epilepsy should be explored after six weeks of unsuccessful treatment with drugs, and condemns the practice of waiting till optic neuritis has developed. He again draws attention to the palliative operation in hopeless cases, and insists further on the value of this procedure, adding two more to his previous cases of arrest of the growth and disappearance of the symptoms. He advocates, as previously, the surgical removal of gummata. His experience of the last two years has proved that the method of doing the operation in two stages, in order to avoid the shock which used to be such a source of danger, is adequate for the purpose for which it is designed, and no case should now terminate fatally from this cause.

Meningitis.—Ormerod¹ reports 10 fatal cases of acute idiopathic cerebrospinal meningitis with autopsy. Clinically, it seems worthy of note that with the exception of fever (present in 9 out of the 10 cases) only one symptom—viz. vomiting—was observed so often as 5 times. Headache

¹ *Lancet*, March 23, 1895.

might possibly make another exception, as it was always present unless the patient were too young or too ill to complain, but the number of times is not stated. Retraction of the head was noted only 3 times, and stiffness of the neck once. Twitching of the facial muscles was observed 4 times, convulsions twice, strabismus 4 times, ptosis and nystagmus each once, conjugate deviation of the eyes or head 4 times. Of 5 cases examined ophthalmoscopically, 2 showed a doubtful optic neuritis. Restlessness or irritability was present in 4 patients, noisiness or delirium in 3. Visual hallucinations were twice observed, early coma an equal number of times, irregular pulse 3 times, herpes facialis twice, a petechial rash and a "fleeting erythema" once each; 1 case was fatal in thirty hours. With regard to the pathology, he finds the posterior surface of the cord more affected than the anterior, and the exudate more frequent in the dorsal and lumbar regions than in the cervical; every postmortem examination should therefore include the entire length of the cord.

Meningitis from Otitis.—Dr. Wiener¹ records a rather unusual but instructive case. A boy of fourteen years complained first of pain in the right ear and occipital region, and later on in the left side of the head. There was no discharge from the ear and no eye-symptoms. He died on the seventh day, and the postmortem examination revealed necrosis of the petrous portion of the right temporal bone and acute meningitis limited to the *opposite side*. [We have seen a similar case.] It was then learned that four months previously he had had a suppurating otitis media that had apparently healed.

Hereditary Cerebellar Ataxia. (See also Friedreich's Disease.)—Hereditary cerebellar ataxia was added to our nosography by Marie, who bases the creation of a new type not upon personal observations, but upon those of Fraser (2 cases), Nonne (3), Sanger Brown (8), and Klippel and Durante (3), published under different names. Paul Londe² adds to these 3 of his own and several from the literature, making a total of 25 cases, and insists that the disease cannot be rare. Under etiology we note that the majority of the cases begin after the age of twenty, a fact that explains why the disease is found among immediate ancestors oftener than Friedreich's disease, as the patients have time to marry before the onset; that alcoholism in the father seems to play a role in the etiology. [Oppenheim and others have shown this in regard to numerous other nervous diseases.] A neurotic heredity also comes into play. In the only autopsies so far made tuberculosis was found, and has been observed in other cases during life. The disease ordinarily begins by a progressive uncertainty of the lower extremities in standing and walking, but its commencement has been marked by pains. In from one to three years this uncertainty attacks the hands, and about the same time appear difficulties with speech and vision. The knee-jerk is preserved, often exaggerated, and occasionally there are other spastic phenomena. Mental feebleness has been noted. Trouble in deglutition, in the genitourinary system, and of the sphincters is exceptional.

¹ Am. Med.-Surg. Bull., April 15, 1895.

² Thèse, Paris, 1895.

Closing the eyes does not increase the swaying when standing (Romberg's sign) nor the uncertainty of movements as in locomotor ataxia. Patients do not use the arms to balance with, nor regard the floor when walking, but fix some point ahead, as does a ropewalker. The uncertainty is of the staggering, cerebellar type. The muscular sense is generally intact. The inco-ordination of the upper extremities produces hesitation in the act of grasping, and the hand "hovers" at the moment of prehension. Involuntary prolongation of muscular contraction has been observed, making it impossible, for example, for the patient to relax his grasp promptly. Intention-tremor has been noted, and also choreic movements; and closely related to the foregoing is over-action of the facial muscles, particularly when the patient is speaking. The speech is not scanning, but jerky, and at times explosive. The muscular strength is not notably diminished. There is generally some psychic change, patients being likely to show depression and irritability, with weakened memory and power of attention—what Seeligmüller has graphically called "ataxia of thought." There are no objective disturbances of sensation, except such as may be attributed to hysteria. Scoliosis, if present, is slight, and the same may be said of club-foot. Nearly 90 per cent. of the cases show some ocular trouble, the most common being atrophy of both disks, with consequent amblyopia or even amaurosis. In more than half the cases the pupils were normal; in others they reacted sluggishly to light. Typical nystagmus does not occur, but jerkiness of the eyeballs is frequent, and paresis of the external rectus and ptosis are not rare. Hearing, taste, smell, the thoracic and abdominal viscera, present nothing abnormal. The author divides the cases into those that have and those that have not ocular symptoms, the latter having been excluded from this category by Marie in his original paper, but fully admitted by Brissaud. The pathologic anatomy is essentially a simple atrophy of the cerebellum (without sclerosis), which may be general and uniform or affect certain parts only, especially the superior. Fraser found in his cases some small cysts, to which, however, he attributes but little importance. Nonne, in addition to the cerebellar atrophy, found a general atrophy of the entire nervous system and a disproportionate number of fine fibers in the anterior roots of the spinal cord. [The word "atrophy" would appear to us peculiarly inapplicable to cases such as these. The condition belongs to arrested or imperfect development.] In this case the cord was normal, but in the case of Menzel (the sole remaining autopsy)¹ the cord also was involved—posterior columns, crossed pyramidal tracts, cerebellar tracts, and columns of Clark: that is, the cord-lesions were those of Friedreich's disease, but there was also atrophy of the nuclei of several cranial nerves. In considering the pathologic physiology of the affection the author starts with the assumption that if the symptoms of hereditary cerebellar ataxia can be produced by experimental suppression of the cerebellum, it proves the lesion of this disease to be cerebellar. But

¹ One of Sanger Brown's cases has recently come to autopsy. There were no naked-eye lesions and the microscopic examination has not yet been made.

this proposition manifestly contains fruitful sources of error, as the same symptoms may be produced by different lesions. For instance, paralysis of one leg may be produced by a cerebral, spinal, or peripheral lesion. This chapter is, indeed, the least satisfactory of the work, although abounding in suggestive hints. Under diagnosis are considered muscular atrophy of the Charcot-Marie type, Thomsen's disease, locomotor ataxia, chronic chorea, the ataxic paraplegia of Gowers, atrophy of the cerebellum, spastic paraplegia of the family type, cerebral diplegia, multiple sclerosis, and the hereditary ataxia of Friedreich. The interest centers in the last two, and particularly in Friedreich's disease. Multiple sclerosis of cerebellar location may present so perfect a picture of hereditary cerebellar ataxia that the only distinguishing trait is the one of family type, and if but a single member of a family should be attacked with the latter disease, it might be impossible to make the diagnosis. [In considering the differential diagnosis between hereditary cerebellar ataxia and the hereditary ataxia of Friedreich the author encounters almost insurmountable difficulties in sustaining his thesis of a distinct pathologic and clinical entity, and, although he says at first that the clinical distinction is sufficiently easy to make, in his conclusions he seems to be near to "begging the question."]

Senator¹ published a case of Friedreich's disease in the early stage, and expressed the opinion that it was essentially a congenital atrophy of the cerebellum or important parts thereof, accompanied by congenital atrophy of the spinal cord. This stand was severely attacked by Schultze, who claimed, first, that Senator's case was not one of Friedreich's disease at all, principally because the knee-jerks were retained, there was no locomotor (only static) ataxia, and other known symptoms of hereditary ataxia were not very marked; and, second, that the essential pathologic condition in this disease is a combined sclerosis of the lateral and posterior columns. In his second paper Senator reports further on the same case, in which the symptoms had further developed, notably complete disappearance of the knee-jerk on one side and almost complete absence on the other, and apparently shows that it is a progressive case and will later develop a complete picture of Friedreich's disease. The case of Menzel, above alluded to and classed by Londe as hereditary cerebellar ataxia, showed at first exaggerated knee-jerks, while later they were hardly to be elicited. One of the patients of Klippel and Durante (hereditary cerebellar ataxia) showed at first normal knee-jerks, but when examined two years later by Oulmont and the author these had disappeared. [We have seen a case of Friedreich's disease with the knee-jerks still preserved, but they had been decreasing in distinctness. Now, as the presence or exaggeration of the knee-jerk is the most distinctive trait of Marie's disease as distinguished from that of Friedreich, we are placed in some doubt as to the existence of two types. The author bridges this difficulty by assuming that the type of Marie may pass into that of Friedreich by the process extending from the cerebellum to the cord, but affirms that

¹ Berlin. klin. Woch., No. 21, 1893, and Nos. 28 and 33, 1894.

the converse has never been observed, and hence the types are distinct. But this is only specious reasoning, for it is at once apparent that a process starting in the cord and thus abolishing the tendon-reflexes (type of Friedreich) could not restore them (type of Marie) by passing on to the cerebellum and producing the typical changes of hereditary cerebellar ataxia. Other points in the differential diagnosis are: the age at onset, the patients being older in hereditary cerebellar ataxia than in Friedreich's disease; the ocular symptoms, which are absent in the latter; the absence of scoliosis and of trophic trouble in the former, because the cord is intact. But not one of these differences is constant, and positive exceptions have been noted to each. As Charcot has remarked, diseases of the family type oftener than others show transition and atypical forms, and this seems to apply very well to the affections under consideration.]

The cases of Neff¹ show distinctly a family type and great resemblance to both Friedreich's and Marie's diseases, but are different from both. The onset is between the ages of fifty-five and sixty-five, and there is frequently marked mental deterioration. The knee-jerks are preserved or exaggerated, as far as known. Boucharde² has described still another variety. A brother and sister were attacked at the ages of five and seven respectively, the principal symptoms being the cerebellar gait with ataxia of the upper extremities, scanning speech, *pes equinovarus*, and arrested mental development. Reflexes and sensation were intact. The autopsy revealed sclerosis in the lateral columns of the spinal cord, and in one of the cases degeneration of the cells in the anterior horns.

[In brief, hereditary cerebellar ataxia is to be distinguished clinically from Friedreich's disease by the absence of certain symptoms, all of which it may in time take on, and by the frequent presence of ocular symptoms, generally absent in the latter; but the latter may in turn take on these same ocular symptoms. Pathologically, we have in hereditary cerebellar ataxia an atrophy of the cerebellum, with at times certain changes in the spinal cord; in Friedreich's disease these same cord-changes, and at times (not always, as Senator would have it) an added cerebellar atrophy. It seems reasonable, then, to conclude that in these two affections we have but one disease, affecting a sensorimotor system concerned with coordination and equilibration, and that, as one or the other part of the system is first or exclusively affected, so the clinical picture will vary. Hereditary cerebellar ataxia is thus but a form of Friedreich's disease.] Since the above was written Nonne³ has published 6 most interesting cases bearing on this question and showing various transition forms. His conclusions practically coincide with those here stated.

Apoplexy and Temperature.—Dana⁴ makes a valuable contribution to this subject based upon a study of 45 fatal cases of cerebral hemorrhage and

¹ Am. Jour. Insanity, Jan., 1895.

² Rev. Neurol., No. 1, 1894, and Gaz. heb. de Méd. et de Chir., No. 28, 1894.

³ Arch. f. Psych. Bd. xxvii. Heft 2, p. 479.

⁴ Am. Jour. Med. Sci., June, 1894.

38 of acute softening from thrombosis or embolism. He concludes that a rise of temperature the first (less the second) day after the stroke as a rule indicates hemorrhage, but may be caused by softening which is very extensive or which involves the pons; that in hemorrhage the rise of temperature is greater on the paralyzed side (about one degree); a difference in the two sides does not occur, or only to a very slight extent, in softening; that the rise of temperature depends more upon the extent and nature than upon the location of the lesion, except that in pontine lesions and cortical hemorrhage there is almost always an increase of temperature; that we have not yet sufficient data for locating thermic centers in the human brain.

Ingravescent Cerebral Hemorrhage Treated by Ligation of the Common Carotid Artery.—[Ingravescent cerebral hemorrhage is notoriously fatal, and in a given case it is impossible to make more than a probable diagnosis between this and thrombosis, but the operation would seem to be indicated in selected cases.] Dercum and Keen¹ report 2 such cases. In the first there was progressive paralysis for three days, when the ligation was done, with arrest of the symptoms and ultimate recovery. The second case was more rapid, as from two o'clock, the time of the onset, to ten o'clock, the time of the operation, the hemiplegia had become complete and unconsciousness had supervened. There was no arrest of the symptoms and the patient died in a few days.

Cerebral Softening.—Beevor² says that hemiplegia with hemianesthesia and homonymous hemianopia points to extensive softening involving the posterior part of the internal capsule and the optic radiations, for to cause these symptoms a cortical lesion would have to be of almost impossible extent, and a hemorrhage sufficient to cause them, even in the locality mentioned, would likely cause death or at least extreme shock and prolonged coma.

Causes, Mode of Onset, and Prognosis of Apoplexy.—Dana³ bases a very instructive paper on this subject upon 82 fatal cases with autopsy and 100 non-fatal cases. We give only the more important results of this investigation. For fatal cases the special "apoplectic age" is between forty and forty-five, while of those not fatal rather more occur between thirty and forty. This seemingly early age is due to the fact that of all his cases fully one-third were due to syphilis. [Although this proportion is probably too large for rural districts, neurologists will be likely to agree that it does not exceed the rule for urban populations.] Another third is accounted for by the puerperium (4), typhoid fever (1), lead (5), nephritis (1), cardiac disease (5), and alcohol, or this with exposure (15). [We beg to call particular attention to the fact that in 5 cases lead was accounted the primary etiologic factor and nephritis only 1.] Of the remaining third the author considers "heavy eating with insufficient exercise and some congenital tendency to arterial disease" to be the predominating cause. [The dictum "excessive

¹ Jour. Nerv. and Ment. Dis., Sept., 1894.

² Lancet, May 5, 1894.

³ Med. Rec., Feb. 23, 1895.

mental work does not lead to apoplexy" is worthy of repetition, although it is believed that few physicians now give to mental over-work the prominent place in the etiology of organic nervous affections formerly accorded to it. We wish especially to note also that a large number of the cases are referred to acute thrombotic softening, particularly those of recurrent attacks, for there seems to be an unwarranted tendency on the part of the general physician to consider cerebral apoplexy as synonymous with cerebral hemorrhage. The author says: "So far as my experience and records go, cerebral hemorrhages are rarely repeated;" but he makes those occurring at an advanced age exceptions to this rule. He thinks it unnecessary to consider the various theories employed to explain how an artery can rupture during quiet sleep, for he finds all these cases of nocturnal apoplexy to be due not to hemorrhage, but to softening from vascular occlusion. He denies, too, that prodromata are frequent in hemorrhage, and says that these when present indicate thrombosis.]

Spasmodic Laughter and Weeping in Organic Brain-disease.—Two remarkable lectures have appeared on this subject.¹ Both authors assume that movements of expression, as laughter and weeping, are coordinated in the optic thalamus, and that in organic brain-disease the uncontrollable laughter and weeping are caused by the cutting off from this ganglion of inhibitory influence. But Bechterew would locate the lesion in the cerebral cortex, and Brissaud near the knee of the internal capsule or lower down toward the pons. It seems to us that the latter view is the more reasonable, and we should consider this symptom, when prominent, as indicating a lesion near or below the basal ganglia.

Recurrent Oculomotor Paralysis.—Knapp² reports a case of this strange affection and presents an excellent table of 44 cases. It is also called ophthalmoplegic (not ophthalmic) migraine (Charcot), and consists of repeated attacks of paralysis of the third nerve, occasionally associated with paralysis of another cranial nerve, and generally preceded or accompanied by severe pain in the head, nausea, and vomiting. Chabbert³ proposes to call the affection migrainous ophthalmoplegia, as in the case reported by himself there were present at first simply the ophthalmic symptoms, and later the ocular paralysis without any of the sensory and other usual accompanying symptoms. The patient, a male of fifty-three, had had for years repeated transitory attacks of hemianopia with scintillating scotoma, but without any pain, vomiting, paresthesiæ, or aphasia. Finally was added an incomplete ophthalmoplegia of both sides. This persisted for about a year, and then began to improve, the ophthalmic attacks also improving, until, after six months, it had almost entirely disappeared. Brissaud⁴ also reports a case

¹ V. Bechterew: *Arch. f. Psych. u. Nerv.*, Bd. xxvi. p. 791; Brissaud: *Leçons sur les Mal. nerv.*, p. 446, and *Rev. scientifique*, Jan. 13, 1894—translation in *Chicago Med. Recorder*, Sept., 1894.

² *Boston Med. and Surg. Rep.*, Sept. 27, 1894.

³ *Prog. méd.*, April 13, 1895.

⁴ *Leçons s. l. Mal. nerv.*, p. 412, 1895.

that is exceptional (but not unique) in that the abducens was equally affected with the motor oculi. [The pathology of these cases is not yet cleared up. They will probably be found to be of various nature. The few autopsies thus far made indicate some organic disease (tumor, meningitis, dementia paralytica) as the basis, but some are doubtless functional. It is a question in our minds if the term "migrain" should be applied to those cases unaccompanied by headache, although such attacks may take the place of ordinary migraine, as shown by Feré years ago, and indeed Chabbert's case is an example, as the patient from the age of twelve to fifteen had suffered from attacks of sick headache. In the thesis of Darquier (Paris, 1893) is an excellent review of the subject up to that time.]

SPECIAL CORD-DISEASES.

Friedreich's Disease. (See Hereditary Cerebellar Ataxia.)—The following notices embrace the most important papers of the year: Nolan¹ reports 3 interesting cases associated with genetous idiocy. The 3 cases occurred in a family of 8 children—a girl of twenty-one (third child), a boy of fifteen (fifth child), and a boy of ten (eighth child). They seem to have been undoubted cases of Friedreich's disease, but touch in certain respects nearly all the subgroups that have been made of hereditary or family ataxia, notably the second case in having exaggerated knee-jerks and ankle-clonus. Besold² reports 4 cases that might be called typical, but they vary from the type in showing not a trace of hereditary influence, and in beginning, some earlier, some later, than the age indicated by Friedreich. Burr³ gives the clinical history and microscopic appearances of a case. One brother had the same disease. The trouble began at the age of ten with a shaking of the hands when eating, and some staggering. The symptoms were all aggravated by an attack of typhoid fever. Paresthesiæ were pronounced, but there were no shooting pains; later there was slight anesthesia. Otherwise the symptoms were typical. [It is worthy of note that the postmortem showed the brain, pons, medulla, and cord to be undersized, evidencing a deficient development, which in these cases is not rare, but does not always affect the same parts. The microscope showed the usual lesions in the cord, but the cerebellum and peripheral nerves were apparently not examined, which is to be regretted, as here lies the debatable ground in the pathology, and every contribution to the evidence, positive or negative, is of value.] Mackay⁴ reports 1 isolated and 2 hereditary cases, the latter presenting no particular peculiarities. [The former is atypical, and the author is at great pains to exclude chorea and locomotor ataxia, but never seems to think of hysteria. In fact, however, there is nothing in his case, as reported, that hysteria will not explain, except the loss of the knee-jerk, and it is not rarely difficult to elicit that in children of the patient's age, thirteen years.] The principal symptoms followed an attack of articular rheumatism with endocarditis. Muscular twitch-

¹ Dublin Jour. Med. Sci., May 1, 1895.

² Deutsch. Zeit. f. Nerv., Bd. v. Hefte 2 and 3.

³ Univ. Med. Mag., June, 1894.

⁴ Am. Jour. Med. Sci., Aug., 1894.

ing and jerking were noticed, and some incoordination in walking. Two months later the child was pale, thin, with a slightly anxious expression and a persistent slight frown of the corrugators. There was occasional slight twitching of the face- and arm-muscles, the legs were extended, and the feet in equinus position. A patch of anesthesia was found on the external surface of the right knee, and there was slight jerking of the eyeballs on looking sharply far to the right or left. Voluntary power was good and the muscular sense normal. The handwriting showed a fine tremor. Taylor¹ has reported two cases from the service of Hughlings-Jackson. In 1 case the knee-jerks were present, although less pronounced than normal. Taylor thinks the presence or absence of the knee-jerk in this affection depends on the location of the sclerosis: if this is principally of the lateral tracts, the jerks will be exaggerated; if principally of the posterior columns, they will be lost. Mitchell Clarke² reports a case with autopsy that was complicated with sarcoma of the cerebellum. Dreschfeld³ reports 2 cases that were not of the family-type. They were otherwise typical. Mackenzie⁴ also observed a case that in every way conformed to the type, except that no heredity could be traced. S. Weir Mitchell⁵ reports a peculiar case of what he considers to be cerebellar ataxia in a child of three and a half years. The gait was very ataxic, but of the spinal rather than the cerebellar type; sensation and the reflexes were normal; there was no deformity and no atrophy. There was strabismus with nystagmus. [The author infers the presence of a cerebellar lesion, but we find it difficult to reconcile this assumption with the improvement which the child had already undergone, unless we imagine a stationary lesion with vicarious action of some related part. It would seem much simpler to assume a general slowness of development due to the many previous illnesses that the child had passed through, so that he retained the natural ataxia (uncertainty of movement) of early infancy.] Tooth⁶ has described a variety of hereditary spinal disease similar to Friedreich's disease, in which the knee-jerks were exaggerated.

Locomotor Ataxia.—Bechterew⁷ confirms the favorable reports of others regarding Fränkel's treatment of tabes (gymnastics), and concludes: 1. Ataxic motor disturbances may be materially improved. 2. The muscular strength may be improved. 3. Self-confidence, absence of which adds greatly to the disability, is aroused. 4. The muscular sense and Romberg's sign are improved. 5. The pupillary changes and knee-jerk are unaffected. Blondel⁸ reports very good results in the treatment of the pains from somewhat prolonged extension by the method of flexion. The patient lies on the back, the thighs are strongly flexed on the trunk, the knees approached as nearly as possible to the chin, and so retained by a band passing back of the

¹ Practitioner, Nov., 1894.

² Ibid., April 21, 1894.

³ Med. News, July 7, 1894.

⁴ Neurolog. Centralbl., No. 18, 1894.

⁵ Brit. Med. Jour., Dec., 1894.

⁶ Am. Jour. Med. Sci., April, 1894.

⁷ St. Barth. Hosp. Rep., xxvii.

⁸ Rev. de Thérap., April, 1895.

neck, for the space of five minutes. This treatment is carried out every evening.

Collet¹ says that auditory troubles are of two kinds—an affection of the auditory nerve similar in every way to the affections of the other cranial nerves which occur in tabes, and a trophic disease of the middle and internal ear that is due not to an affection of the auditory, but of the trigeminus. He reports a number of cases in which there was in addition to the ear-affection similar disturbances in other parts supplied by the fifth (falling out of the teeth² and other trophic troubles, lightning pains, neuralgia, anesthesia, and vasomotor disturbance). In some cases the trouble could be shown clinically to be of the middle ear and not of the nerve.

Leo Newmark³ reports a case of *trophic lesions of the jaws* in a man of forty-three, with undoubted tabes, who lost within the space of a few months all the teeth of the upper jaw, as well as a number of sequestra. There were also sluggish ulcers with extensive caries of the bone opening into the antrum on either side. There was no anesthesia in the distribution of the trigeminus except in the affected areas of the buccal cavity, and up to the time of the report the lower jaw had not been attacked. Letulle and Ler-moyez⁴ report similar cases.

Syms⁵ gives a résumé of the subject of *arthropathies*, and reports 2 cases. [He thinks the arthropathies are due to an affection of the peripheral nerves, but they never occur in multiple neuritis, and they do occur in syringomyelia when there is no degeneration of the nerves.⁶] Frank Billings⁷ reports an interesting case of most extensive arthropathies in a boy of eighteen, all the major and most of the minor articulations being involved. The author makes the diagnosis of Charcot's joints and a provisional diagnosis of tabes, based principally on the arthropathies themselves, supported by optic neuritis or atrophy and the rapid heart-action. The deep reflexes were abolished, but it is impossible to say whether this was due to a cord-lesion or to the affection of the articular and periarticular structures.

As to *analgesia of the ulnar trunk as a symptom of tabes and general paralysis of the insane*, Biernacki⁸ has discovered that in the majority of cases of locomotor ataxia sharply pressing the ulnar nerve against the bone as it passes over the internal condyle of the humerus does not cause pain, as is almost invariably the case in normal individuals. Of 20 cases examined, this analgesia was present on both sides in 14 and on one side in 1. [We may add that we have examined for this symptom in quite a number of cases of tabes and have found it present in at least the above proportion.] Cramer⁹ has investigated the symptom in insanity and found it an important symptom in general paralysis of the insane. Of 51 cases examined, 39 showed the

¹ Prog. méd., No. 49, 1894.

² Med. News, Jan. 26, 1895.

³ N. Y. Med. Jour., Jan. 19, 1895.

⁴ Chicago Med. Recorder, Feb., 1895.

⁵ Münch. med. Woch., July 10, 1894.

⁶ V. infra.

⁷ Med. Week, ii. 20, p. 355, 1894.

⁸ For pseudotabes, v. Neuritis.

⁹ Neurol. Centralbl., April 1, 1894.

symptom on both sides and 7 on one side; that is, together, 90 per cent., while of 63 cases of other forms of insanity in only 20 per cent. was it present, and of these the failure to respond was in a number of instances to be referred to the mental condition. No anatomic basis for the symptom has as yet been discovered.

The painstaking investigations of Ziehen¹ have shown the *Achilles tendon reflex* to be of considerable diagnostic importance. From his very full report we extract the few following points: Of 158 cases of dementia paralytica, in only 57 was the Achilles jerk normal. Of the abnormalities, absence or weakening of the jerk was twice as frequent as foot-clonus. As loss of the jerk in health, in neurasthenia, and in the functional psychoses is exceedingly rare, the diagnostic importance of the above fact is easily appreciated. In the differential diagnosis between dementia paralytica and senile dementia, cerebral syphilis and chronic alcoholism, changes in the Achilles jerk are of no value. In cerebral syphilis loss of the knee-jerk or of the pupillary reflex on one side may be the only objective sign, and the same is true of the Achilles sign. In secondary or congenital idiocy (or imbecility) the sign is of small importance, except that in congenital cases its absence may be considered as rather pointing to hereditary syphilis. The author emphasizes the fact, already known, that foot-clonus or an inequality in the foot-jerk may occur in hysteria. Sternberg² even finds clonus in 20 per cent. of the cases. When there is a difference in the two sides, the reflex is exaggerated on the side of the hysteric manifestations (anesthesia, paresis, etc.). In chronic alcoholism the Achilles jerk may be absent, simply exaggerated, or clonus may be evoked.

Paralysis in the Distribution of the Peroneal Nerve in General Paralysis of the Insane.—Of this affection Moeli³ reports 5 cases: The first case was of a merchant, of forty-five, whose general condition was very fair. Without apparent cause sudden complete peroneal paralysis appeared on right side. Electric excitability was moderately diminished, but no reaction of degeneration was present: sensation was but slightly affected, and there was no atrophy. Recovery followed in six weeks, but death ensued from pneumonia two and a half months later. Microscopic examination showed distinct degeneration of the posterior columns of the spinal cord; no marked changes in the nerve-trunk or muscular branches; in some tegumentary branches slight atrophy of fibers. The second case was in a man, of fifty, who had complete peroneal paralysis of left side, of rapid onset, with decrease of electric excitability; sensation was not markedly affected, and there was no atrophy. At the end of five months there was almost complete recovery. Death followed three months later. Microscopic examination showed marked degeneration of the posterior columns, slight of the lateral columns; there were no marked changes in nerves or muscles. The third case was of a bookkeeper, aged fifty. On admission peroneal paralysis

¹ Deutsch. med. Woch., Aug. 16 and 23, 1894. ² Die Sehnenreflexe, Leipzig and Wien.

³ Neurolog. Centralbl., Feb. 1, 1895.

existed on the right side of two months' standing; the sensibility was normal, and there was slightly diminished electric excitability. Five months later there was almost complete recovery, which continues (three and a half years) in spite of extreme dementia and bodily weakness. The fourth case was of a tailor, aged forty-two, who had sudden complete peroneal paralysis on the right side, without marked changes in sensation or electric reaction, and no atrophy. Marked improvement followed. The fifth case was of a merchant, aged forty-one, with sudden peroneal paralysis on the left side and no sensory disturbance; there was slight diminution of electric excitability reported four weeks after onset.

[The literature furnishes but few of these cases and their nature is obscure. That they are of peripheral, not central, origin does not seem to be doubtful. The author excludes infectious and toxic influences, cachexia, and inanition, as also senile neuritis (Gombault) and nerve-degeneration from vascular obliteration (Joffroy and Achard; Oppenheim). Traumatism is not so easily excluded, especially as experience has shown this nerve to be peculiarly liable to injury. Protracted squatting and kneeling and a single violent muscular action have caused peroneal paralysis. Moeli is inclined to think there is some relation between the degeneration in the posterior columns and paralysis, and emphasizes the fact that although in general paralysis the knee-jerk is lost in only 20 to 25 per cent. of the cases, it was abolished in all 5 of his cases of peroneal paralysis. He does not deny that the loss of knee-jerk may be due to an affection of the anterior crural nerve so slight as to evade detection postmortem, but the frequency of this cause is certainly insignificant as compared to cord-degeneration. As a direct cause of the paralysis he would invoke over-exertion of the peroneal group of muscles, owing to the loss of muscle-tonus in other muscular groups which is the cause, or at least the accompaniment, of loss of knee-jerk. He calls attention to the fact that the raising of the toe and steadying of the ankle-joint play a most important and exacting rôle in the act of walking, and again alludes to the slight causes that may induce peroneal paralysis, and to the neuritis of over-exertion, as in drummer's paralysis. In support of his hypothesis he adduces the fact of rapid recovery when the patient is kept quiet, in spite of the steady progress of the general malady. In conclusion he cites a case now under observation that speaks against his theory. A clear case of cerebral syphilis, with only secondary if any affection of the spinal cord, brisk knee-jerk, and rapid improvement under specific treatment, showing rapid paralysis of left peroneal group, which four weeks later began to improve. It would seem to us that in discussing the etiology of these cases the author has omitted the consideration of an important question—namely, that of the inherent hereditary or developmental vulnerability of the peroneal nerve. The function of dorsal flexion and abduction of the foot is a late development in the evolution of the race and of the individual (babies are born with a varus and often an equinovarus), and would seem to be correspondingly vulnerable. Not only do the structures involved suc-

cumb to the slightest traumatisms, but in the toxemia of alcohol, arsenic, mercury, carbon monoxid and bisulphid, etc., as well as in the paralysis after infectious diseases and in beriberi, of all the motor groups of the lower extremities they are ordinarily the first and the most severely affected. This vulnerability presupposed, it is not necessary to assume any one exciting cause, either in general paralytics or others, as any one of many possible fortuitous influences may suffice to cause the paralysis.]

Paraplegia from Pott's Disease.—Binaud and Crozet¹ report 2 cases in which laminectomy was performed for the relief of the paralysis, with a good result in 1 case. [But it can scarcely be said to be positive evidence in favor of the operation, as the condition of the patient was such as is frequently recovered from without operation. We do not agree with the authors in their assertion that the operation *can do no harm* and may do good.]

Spinal Concussion.—Knapp² insists that there are traumatic injuries of the spinal cord that cause but little immediate trouble, but that do give rise to permanent and serious changes, causing marked sensory and motor disturbances. He does not deny the psychic nature of many cases, but contends that some are instances of real injury to the spinal cord, although there may be no fracture or dislocation of the vertebræ, no compression, *hemorrhage, or other gross lesion*. He implies that the change is a nutritional one, but does not exclude *punctate or capillary hemorrhages*. [While agreeing with the author in the main, we submit that these latter are to be regarded as organic lesions, as the only difference between a punctate hemorrhage and hematomyelia is one of size.]

Brown-Sequard Paralysis.—[Recent anatomic and physiologic researches have thrown much doubt, to say the least, upon formerly-accepted ideas as to the course of the sensory tracts in the spinal cord, and have made the heretofore universal conception of Brown-Séquard's paralysis almost impossible; but cases continue to be reported³ which are as typical as ever, and the affection as a clinical entity still stands.]

Early Infantile Progressive Muscular Atrophy of Spinal Type.—Werding⁴ contributes to the number of these as yet rare cases the further history and postmortem findings of 1 case. [These cases are of interest and importance clinically and pathologically, inasmuch as they present most of the symptoms of so-called primary muscular dystrophy (idiopathic muscular atrophy), with most of the lesions of spinal muscular atrophy. Like the former, the disease occurs in family groups and in early childhood (tenth month); attacks first the pelvic and thigh muscles, and then those of the shoulder and upper arm; the paralysis and atrophy are massive, not fibril-

¹ Arch. clin. de Bordeaux, Jan., 1894.

² Boston Med. and Surg. Jour., July 5 and 12, 1894.

³ Notably 3 cases by Pearce Bailey (N. Y. Med. Jour., March 9, 1895) and Brissaud (Leçons sur les Mal. nerv., Paris, 1895).

⁴ Arch. für Psych. u. Nerv., Bd. xxvi. p. 706.

lary ; the paralysis is flaccid, and bulbar symptoms are rare. But it is much more rapid in onset and course (one to five years) than muscular dystrophy ; pseudohypertrophy never occurs ; fibrillary twitching is often observed, and reaction of degeneration is generally well marked. As in spinal muscular atrophy, microscopic examination shows atrophy of the ganglion-cells of the anterior horns of the cord, the white substance being, as a rule, though not invariably, normal. Hoffman classes these cases as progressive muscular atrophy,¹ but Werding—we think rightly in the light of the present evidence—makes a separate sub-class of them. From multiple neuritis they are distinguished by the lack of pain and disturbances of sensation and of tenderness of the nerve-trunks and muscles, by the family type of the affection, the distribution of the paralysis, and the progressive course. Neurotic progressive muscular atrophy may occur in childhood, is likely to be of family type, and the atrophied muscles exhibit reaction of degeneration, but the course of progress is invariably from the extremity of a member toward the trunk, and pain is a prominent symptom. Progressive muscular atrophy of the Aran-Duchenne type never occurs in childhood, and nearly always begins in the small muscles of the hand. In amyotrophic lateral sclerosis we have an affection of adult life, exaggerated tendon reflexes, no hereditary element, progression by small bundles of fibers, and generally from the periphery toward the trunk, all of which is foreign to the disease under consideration. Acute poliomyelitis is easily distinguished by its more sudden onset, at times with symptoms of acute infection, and by the subsequent course ; it shows improvement for a time and then remains stationary.]

The Reflexes in Total Transverse Lesions of the Spinal Cord.—[Bastian's assertion that a total transverse lesion high up in the cord abolishes the knee-jerk is well known, and has received the unqualified support of Bowlby, Thornburn, Bruns, and others, although all are not satisfied with his explanation, which really comes from Hughlings-Jackson, that it is the cutting off of cerebellar influence that makes the knee-jerk impossible.] Gerhardt's case,² which he considers as positive evidence against the view of Bastian, a boy of seventeen, whose trouble began with a feeling of weakness in the right foot, gradually became paraparetic, in sixteen days was unable to walk, and a month later had become completely paraplegic. Sensation gradually diminished to a level above the umbilicus, but was not completely abolished until two years later. The knee-jerks were greatly exaggerated up to the fourth year of illness, when they began to diminish ; by the end of the year were completely absent, and were not to be obtained up to the time of death, about five years from the onset. The superficial reflexes were retained, but they gradually altered in character, becoming very slow. The autopsy revealed an angioma extending from the fifth to the eighth dorsal vertebra, which had compressed and completely destroyed the cord in this region. Gerhardt explains the loss of knee-jerk by referring it to the

¹ Deutsch. Zeits. f. Nerv., Bd. iii.

² Ibid., Bd. vi. p. 127.

marked contractures that had developed, with supposed changes in the muscles and joints. [Such changes might possibly be an adequate cause, but it seems fully as reasonable, if not more so, to assume that this slowly-growing tumor—slowly growing, as shown by the long retention of sensibility—only accomplished the complete destruction of conducting paths in the cord at the end of three or three and a half years, and that from this time the tendon reflexes were lost.]

Infantile Spinal Paralysis (Acute Anterior Poliomyelitis).—[The tendency of late has been to depart from the dictum of Chareot, that this disease is a primary affection of the motor-cells of the anterior cornua, and to consider it as a more or less diffuse myelitis of vascular and interstitial origin affecting the anterior more than the posterior half of the cord.] Goldscheider¹ in reporting a case concludes that the grouping of the changes is determined by the vessels. "The selection of the degenerated ganglion-cells follows not the different cell-groups, but the distribution of vascular twigs." Siemerling² reports 2 recent cases, the one patient dying eight, the other four days after the onset, with careful microscopic examination. He supports this view, and concludes that the pathologic process centers about the anterior median spinal artery. Redlich³ reports the case of a child of five months, with all the symptoms of severe anterior poliomyelitis, who died on the tenth day from paralysis of respiration. The very careful microscopic examination showed inflammatory foci in the white substance of the brain, in the basal ganglia, one crus, and in the medulla, but the principal changes were found in the cervical and lumbar cord. The process here was also distinctly inflammatory, and not confined to the anterior horns nor to the gray matter, the posterior horns, the lateral and anterior columns, being also affected, although to a less degree. The anterior roots and some nerve-trunks also showed degeneration. The author believes in the infectious nature of the disease, and that at least some of the cerebral symptoms at times observed are due to direct involvement of the brain itself. Trevelyan,⁴ examining the cord of a child of six years who died eleven months after the onset of the disease, also concludes that it is of vascular and interstitial rather than parenchymatous origin. More evidence along this line is adduced by the case of Dauber.⁵ An infant of eight and a half months died on the fifth day. The microscopic examination revealed changes inflammatory in character and diffuse as to location. There was cellular infiltration of the pia mater and marked hyperemia of all the vessels of the cord. The adventitia of the larger vessels was greatly thickened by infiltration of round cells and some long (spindle) cells. Similar cells infiltrated the neuroglia-tissue, and the author thinks they all came from the blood, not from the adventitia or neuroglia by proliferation. There was also some escape of red blood-corpuscles. The ganglion-cells of the anterior horns, and to a less degree

¹ Wien. klin. Woch., No. 16, 1894.

² Brit. Med. Jour., Sept. 22, 1894.

³ Zeitsch. f. klin. Med., Bd. xxiii. Hefte 5 and 6.

⁴ Arch. f. Psych., Bd. xxvi.

⁵ Deutsch. Zeitsch. für Nerv., Bd. iv. p. 200.

those of the posterior horns, were degenerated. The changes, as a whole, were very like those of a central myelitis.

The 3 cases reported by Rissler¹ do not constitute such positive evidence. They were aged four and a half years, five months, and twenty-one years respectively, and died on the seventh, sixth and eighth day respectively. The microscopic appearances in the first 2 were similar, and consisted of degeneration of cells and fibers in the anterior horns, with small hemorrhages and some diapedesis of the red blood-corpuscles, but more especially of the white. There was also increase of nuclei, edema, and a glassy exudate. In some places the ganglion-cells seemed to be the more affected, and in some the interstitial tissue. In the third case there was scarcely any interstitial change except some increase of nuclei, but there was distinct degeneration of the ganglion-cells. Rissler is rather inclined to the opinion of Charcot that the affection is primarily parenchymatous, and that any interstitial alterations present are secondary. Finally, v. Kahlden, basing his conclusions on the literature and 3 personal cases, supports the view of Charcot *in toto*, and actively combats the vascular origin of the affection. His own cases, however, were all old, and consequently not well adapted to clear up this point in the pathology. In this connection, as possibly bearing upon the question of the microbic origin of the disease, it is interesting to briefly consider a peculiar epidemic that occurred in Vermont during the summer of 1894.²

The various towns and villages of a valley 15 miles broad and 30 long, aggregating a population of 2600, furnished 123 cases occurring between June 17th and September 1st. There were possibly more cases in this district, and 6 additional ones occurred outside of, but near, the valley. The first cases occurred on the same day in two different towns. The severity of the disease varied greatly, but the symptoms were essentially those of an acute infectious disease and of anterior poliomyelitis. The following condensed notes of a few cases will serve to give an idea of the clinical picture: A boy of three had moderate fever, a coated tongue, anorexia, and sluggish bowels, and it was then noticed that the legs were paralyzed, so that he could not stand alone; but he rapidly improved, and in three weeks was quite well. A boy of three and a half years had a temperature of from 102° F. to 103° F., which abated on the third day, when he was seen to be paralyzed, with loss of the knee-jerks, diminished reaction to the faradic current, hyperesthesia, and incontinence of urine. The last continued ten days. The left leg improved rapidly, the right slowly, and some permanent wasting was left over. Another case began with convulsions lasting nine hours. There was moderate fever, tachycardia, vomiting, rigidity of the muscles of the neck and back, and cutaneous hyperesthesia. Death followed on the sixth day. A female

¹ Nordiskt Medicinskt Arkiv, Bd. xx. No. 22.

² "History of an Acute Nervous Disease of Unusual Type," C. S. Caverly, Med. Record, Dec. 1, 1894, and McPhail, "An Epidemic of Paralysis in Children, etc," Med. News, Dec. 8, 1894.

of twenty-one complained of headache and backache. The pulse was 80 and the temperature normal. On the third day the pulse was 100 and the temperature 103.5° F. The eyes were rolled up, the head was drawn back, and there were changing patches of erythema and urticaria. She gradually grew weaker, the pulse sank to 45, and she died on the thirteenth day. Another case also showed an erythematous rash, but with a high fever. A boy of three and a half years had headache, drowsiness, and fever, and on the second day strabismus. The pulse was 45 and irregular, but by the sixth day the child had apparently recovered. He possibly played too hard; two days later there was a relapse, with return of the same symptoms, and death followed. A female of twenty-nine years complained of headache and backache and of soreness in the legs and arms. There was opisthotonos, diplopia, dilated pupils, deafness for several days, with tinnitus and also retention of urine. On the second day the right arm became paralyzed, and during the following four days one extremity after another was affected until all were paralyzed. Gradual improvement then began. The principal symptoms of another patient were fever, nausea, drawing of the head to one side, and a transitory facial paralysis. Generalized paralysis then supervened, which had only slightly improved at the end of two months. One patient had acute symptoms, with a temperature of 104° F., for six days before any paralysis appeared. The right arm was then affected, and the next day the left leg. In another case there was fever for four weeks, and then paralysis of the right arm and leg supervened. More than two-thirds of the cases were under the age of six years and only 13 over fourteen. During the epidemic there were numbers of deaths among domestic animals, apparently from a similar affection, and the examination of the spinal cord of a cock showed fairly well the lesions of poliomyelitis. [In brief, the symptom-complex is that of an acute infection with paralysis and without marked sensory disturbances. Anesthesia is not mentioned in any case. Hyperesthesia, soreness, and some pain are known to occur in poliomyelitis, although not the rule. Retention of urine (7 cases) and incontinence (1 case) would not exclude infantile paralysis, and the process has been known before to ascend to the bulbar and pontine nuclei—notably in the Stockholm epidemic of 1887. The rigidity of the neck and opisthotonos (together 20 cases) are more difficult to range with the symptoms of poliomyelitis, but when we recall that Dauber's case showed injection and infiltration of the membranes they are more easily explained. In a verbal communication in May (1895) Dr. Caverly informed us that the muscular wasting in many instances persisted, with reaction of degeneration.]

Treatment of Infantile Paralysis.—Jones¹ makes a strong plea for the systematic employment of electricity and massage, the treatment to be continued not less than six months or a year. Something can nearly always be gained; the better muscles are strengthened and cultivated, and even individual fibers in the most extensively degenerated muscles may be improved.

¹ *Lancet*, March 10, 1894.

But in all treatment we must remember that the physiologic stimulus, volition, is the best stimulus, and that simple exercise with protection of the weaker muscles will accomplish a great deal.

Syringomyelia.—Beevor and Lunn¹ report a most interesting case. The clinical history extended over more than ten years, and the trouble was for a long time an unsolved riddle. It began with deformity of the hands and shoulders without anesthesia or muscular atrophy. After some years these latter symptoms were added, but for a long period the deformities and trophic changes in the joints and bones of the fingers constituted by far the most salient features of the clinical picture, and the case would seem to lend additional evidence to the belief that Charcot's joints, Morvan's disease, and syringomyelia belong, pathologically, to the same family. A full report of the gross and microscopic postmortem findings is given.

A Family-form of Syringomyelia.—Ferannini² reports 4 cases, a mother and 3 children, which he considers essentially typical, and from them endeavors to more clearly define the place of syringomyelia in our nosology. With regard to the morbid anatomy he lays great stress upon the localization of the lesion. It must affect the central canal or its immediate vicinity, be the process a primary idiopathic one or grafted on to an embryonic anomaly, be it one of the several forms of gliomatosis, of hydromyelus, or a central myelitis with cavity-formation. Corresponding to this assumed pathologic type is the clinical picture presented by his patients, which he describes also as a type and designates the "nosological nucleus" of syringomyelia. In the most peripheral parts of one extremity or the symmetric parts (always the most peripheral) of two members are found subjective disturbances of sensation constantly associated with trophic and vasomotor trouble of the skin, subcutaneous tissue, bones, and joints; that is, of all nonmuscular structures. Among the former are cited formication, a feeling of burning, boring, sticking, or of abnormal mobility, severe pains, similar to the osteocopic pains of syphilis, erythromelalgia, angiospastic acrodynia; among the latter, whitlows, pseudophlegmon, furunculosis, changes in the nails, and hyperhidrosis. After these symptoms have existed for some time at the extremity of a member they may advance proximally and invade others. The subjective anomalies of sensation may be but slight or affect only one kind of sensation, and "disassociation" may be wanting. The author considers the often-present muscular atrophy to depend on a purely incidental involvement of the anterior horns, and the cases simulating progressive muscular atrophy, tabes, and lateral sclerosis he considers atypical from the accidental spread of the process out of its proper domain. The "type of Morvan" he considers to be typical syringomyelia.

Spinal Puncture.—Fürbringer³ reports 86 cases of spinal (lumbar) puncture—over 100 punctures in all. The operation is not difficult, although in a few instances the needle passed into the epidural instead of into the sub-

¹ Clin. Soc. Trans., vol. xxviii.

² Riforma Med., Nos. 137-140, 1894.

³ Berlin. klin. Woch., April 1, 1895.

dural space, and not seldom it was necessary, after puncturing the skin, to seek in different directions for the intervertebral foramen. The dura was found at a depth of from 2 to 7 cm., according to age, muscular development, etc. The patient should be seated, the body strongly bent forward, and the needle introduced at the lower edge of the spinous process of a lumbar vertebra, below the termination of the cord. Narcosis is not necessary. The aspiration is more painful than the puncture, patients complaining of pains in the head, neck, and back. For this reason and others Fürbringer has ceased to aspirate, allowing the fluid to flow away of itself. The hydrostatic pressure which was at times sufficient to make the fluid spurt through the cannula is of no diagnostic value. Besides the pain of aspiration, immediate unpleasant symptoms of the puncture were rare. Slight hemorrhage in the dural sac and slight injury to nerve-roots in the cauda equina were noted. In 27 cases punctured for diagnostic purposes tubercle bacilli were found in the fluid, and the consequent diagnosis of tubercular meningitis was confirmed by autopsy. In 3 cases in which the bacilli were found the diagnosis could not be confirmed; 1 was removed, 1 recovered, and in 1 case autopsy was denied. In 7 cases the examination of the fluid removed was negative, while the postmortem examination showed them to be cases of tubercular meningitis. The puncture may thus be said to have established the diagnosis in 80 per cent. of the cases. In tubercular meningitis the therapeutic result of puncture was nil, even when the intracranial pressure, as seen by the sinking of the anterior fontanelle, was relieved. In 1 case of solitary tubercle of the cerebellum (postmortem diagnosis) the frequent convulsions were diminished one-half by repeated punctures. In 1 case the puncture brought pus, and the diagnosis of cerebrospinal meningitis, made from this finding, was confirmed by autopsy. In 1 case of pneumonia with meningeal symptoms which recovered, pneumococci were found in the fluid. In 4 cases of brain-tumor the results of puncture were practically nil, but in 2, as also in 2 cases of uremia, sudden death followed a few hours after the puncture. All 4 cases were, however, *in extremis*, and, moreover, sudden death is not rare in either of these affections. In 2 instances (once on the cadaver) the puncture confirmed the diagnosis of the rupture of a cerebral hemorrhage into the lateral ventricles. Lichtheim,¹ who was one of the first to employ this procedure and is a strong advocate of its diagnostic worth and therapeutic worthlessness, reports 2 instances of bad results. The first was a case of cerebellar tumor. The tapping caused intense headache, which gradually ended in coma, and death followed the next day. The second was also diagnosticated as brain-tumor. The puncture caused such excruciating pains in the head, chest, and thighs that the patient left the hospital, although the pains ceased in two days and the general condition was improved. Denig² records an instance in which the diagnosis of tubercular meningitis was made by postmortem puncture before further examination. Tubercle bacilli were abundant in the fluid, and an inoculated guinea-pig died in four weeks

¹ Berlin. klin. Woch., April 1, 1895.

² Münch. med. Woch., Dec. 4, 1894.

of tuberculosis. He, with Quinke and Freyhan, recommends puncture during life, and considers it neither difficult nor dangerous.

Cord-changes in the Various Toxemias (or the Pathology of Toxic Paralyses).—It has generally been supposed that in paralysis from alcohol, lead, arsenic, etc. the nervous lesions are confined to the peripheral nerves, but more careful examinations with improved technique have shown that the spinal cord is generally implicated. With Nissl's stain, changes in the ganglion-cells of the cord have now been observed in poisoning by lead, antimony, alcohol, arsenic, bromin, cocain, antipyrin, and nicotin, as well as in experimental tetanus.¹

Experimental Myelitis from the Toxin of Diphtheria.—Enriques and Hallion² did not obtain the same results after the injection of this toxin as did Steherbak,³ who found degeneration of the peripheral nerves only. The former investigators found in the cords of 3 dogs experimented upon foci of congestion, of hemorrhage, and, in 2 cases, of myelitis, principally of the white substance.

The Pathologic Anatomy of Diphtheric Paralysis.—Preisz⁴ examined 2 cases of general and 1 of local (pharyngeal) diphtheric paralysis, and his findings tend to confirm the thesis of P. Meyer⁵ that changes occur in the cord and in the peripheral nerves. He supports Meyer also in the opinion that the changes in both are simultaneous, and this seems most reasonable, but neither has been able to prove that the peripheral changes were not secondary to the central ones. In the nerves changes were found in the anterior and posterior roots, in the trunk, and in the terminal filaments, and consisted of degeneration and disappearance of the medullary sheath, and to a less extent of the axis-cylinder, of increase of nuclei in the nerve-sheath, with rarely inflammatory foci. There were, besides, nodes of concentrically arranged connective tissue, which have been before observed, but which were rightly considered as purely fortuitous so far as the disease was concerned. In the cord some of the cells of the anterior horns showed with the Nissl stain (which is beyond all doubt the best for such examinations) marked changes in the cell-structure, with loss of processes. In one case there were changes in the posterior root-zone and column of Goll which the author considers to be secondary to the degeneration of the posterior root-fibers. [But it is worth remembering that somewhat similar changes occur in pernicious anemia (q. v.), pellagra, ergot-poisoning, and diabetes, and we think it not unlikely that they may occur primarily in other toxic states, such as diphtheria.]

Disease of the Spinal Cord in Pernicious Anemia.—A case is care-

¹ Schaffer: Magyar Orvosi Archivum, ii. 1, 36-51; Pándi: ib., No. 5, 1893; Beck: Orvosi hetilap, No. 32, 1893—abstract in Neurol. Centralbl., Dec. 18, 1894; Vas: Arch. f. exper. Path. und Phar., Bd. xxxiii. p. 141; Van Gilson: Jour. Nerv. and Ment. Dis., July, 1895, p. 444.

² Rev. Neurol., May, 1894.

⁴ Deutsche Zeit. f. Nerv.

³ Ibid., 1893.

⁵ Virchow's Archiv, Bd. lxxxv.

fully reported by Bowman from the service of Hughlings-Jackson.¹ A woman of fifty-three presented the ordinary symptoms of pernicious anemia (red blood-cells 19.5, hemoglobin 20 per cent. of normal), with paresis of the extremities, anesthesia, and brisk reflexes. In three months, under arsenic, the red blood-cells had reached 87 per cent., the anesthesia had disappeared, and the paresis almost so, but a few months later she again became worse, the anemia and feebleness were progressive, she was soon unable to walk, and death ensued fourteen months from the first observation. Microscopic examination of the cord showed marked degeneration of the posterior part of the lateral columns, of the posterior columns and median part of the anterior columns; in other words, a combined degeneration of varying intensity, involving the direct and crossed pyramidal tracts, the direct cerebellar tracts, and the columns of Goll and Burdach. The case confirms in the main the previous findings of German authors,² but the clinical picture in all is not the same, and the location of the degeneration has not always been found to be identical. In some cases the changes approach closely those found by Tuzek³ in pellagra, in others they more nearly approximate those found by the same author in ergot-poisoning,⁴ and the cases altogether constitute a considerable advance in our knowledge of the effect of blood-states on nervous tissues and the peculiar susceptibility of certain parts of the nervous system to certain toxic and nutritional influences.

PERIPHERAL DISEASES.

Treatment of Sciatica.—We can endorse that advocated by Græme Hammond.⁵ The patient is confined to the bed and the leg immobilized by a long hip-splint. Then hot-water bags are kept continuously under the thigh from the sciatic notch to the popliteal space. Galvanism is used once a day for five minutes, the negative electrode being applied to the sole of the foot, which it should equal in size, and the positive one, equally large, placed under the hip as the patient reclines. For the acute pain in the beginning 15-grain doses of phenacetin are administered, or a hypodermic of morphin if necessary. Multiple puncture of the nerve-sheath to allow of the escape of effused serum often affords relief.

Nonoperative Treatment of Metatarsalgia.—Gibney⁶ reports a number of cases cured or relieved by wearing a shoe made over a Spanish last and with a high but broad heel, which raised the instep. The idea is to throw the weight of the body upon the instep and relieve the ball of the foot, the metatarsophalangeal articulation, but the shoe must be made with care and fit snugly.

Facial Paralysis.—Mann⁷ calls attention to the fact that in peripheral

¹ Brain, 1894, summer number.

² Lichtheim and Minnich: Zeitsch. f. klin. Med., Bd. xxi.; Von Noorden: Charité Annalen, 1891; Nonne: Arch. f. Psychiatrie, Bd. xxv.

³ Studien über die Pellagra, Berlin, 1893.

⁴ Arch. f. Psych., Bd. xviii.; Walker: ib., Bd. xxv.

⁵ Post Graduate, Sept., 1894.

⁶ Jour. Nerv. and Ment. Dis., Sept., 1894.

⁷ Berlin. klin. Woch., Dec. 31, 1894.

facial paralysis the orbicularis oris may remain intact when all the other muscles of the face are paralyzed, and instances 6 cases, 2 personal and 4 observed by Cohn, in Mendel's Poliklinik. This omission of the orbicularis in facial paralysis has heretofore been thought to indicate a nuclear affection.¹ Goldzieher² claims that in cases of paralysis of all branches of the facial (that is, in peripheral cases) the secretion of tears on the affected side is arrested, although the eyeball is normally lubricated. This is explained by the nervous distribution, the lachrymal gland being innervated by a branch of the facial by way of the geniculate ganglion, while lubrication is provided for by the conjunctival sac, which is under the control of the vasomotor system. Lannois³ calls attention to the fact that a facial paralysis may be caused by otitis media, without caries or necrosis and when the inflammation is very mild in degree. This is especially true if it attack the inner wall of the tympanum.

Neuritis.—Walker⁴ has never seen a case of peripheral neuritis that did not improve under hypodermic injections of strychnin, and reports the following cases: An alcoholic subject, after three months' treatment with electricity, massage, and salol without improvement, was put on strychnin, from $\frac{1}{80}$ to $\frac{1}{30}$ of a grain hypodermically three times a day, with immediate beneficial results and recovery in six months. Another case, probably alcoholic, had been confined to bed for three months under treatment with salicylates, salol, and electricity, when the strychnin-injections were begun, and in two and a half months the patient was walking about. The third case was a very severe one, and it is worthy of remark that the knee-jerks were exaggerated and there was ankle-clonus on both sides. Antirheumatic treatment for six weeks accomplished nothing, and then the strychnin was begun. He began to improve at once, was discharged from the hospital in eleven weeks, and at the end of a year had completely recovered. Leyden⁵ also strongly recommends strychnin in the later stages. In the acute stage he gives morphin, chloral, or sulfonal to obtain rest, with salicylates and potassium iodid. For traumatic neuritis Delorme⁶ advises that the cicatrix be seized between the thumb and fore finger and tightly pressed for several seconds, to be repeated in a few minutes. This maneuver may need to be carried out every third or fourth day, but the author claims excellent results for the method.

Westbrook⁷ reports a case of what was supposed to be multiple neuritis of the whole left side, with intense left facial neuralgia, in which there occurred deep ulceration of the left tonsil, soft palate, and pillars of the fauces. Carcinoma, lupus, and syphilis were excluded, and the ulcers under local treatment healed in three weeks.

Puerperal Neuritis was first described by Möbius in 1888, and Eulen-

¹ See Gowers: *Dis. of Nerv. Syst.*, vol. ii. p. 245.

³ *Arch. de Neurol.*, Oct., 1894.

⁵ *Berlin. klin. Woch.*, Nos. 19 and 20, 1894.

² *Bull. méd.*, March 4, 1894.

⁴ *Brit. Med. Jour.*, Dec. 22, 1894.

⁶ *Presse méd.*, Dec. 22, 1894.

⁷ *N. Y. Med. Jour.*, Nov. 17, 1894.

burg¹ could collect only 34 cases, to which he adds 4. The affection may begin before confinement, and be mild or severe, local or general. The localized form generally attacks the upper extremities, the median and ulnar nerves seeming to be the most vulnerable. When of the crural or lumbosacral form it is usually unilateral. The onset may be sudden or slow, and in the generalized form the disease may resemble Landry's paralysis. Many of the patients had been troubled with hyperemesis during pregnancy, and in Eulenburg's most severe case abortion was induced on this account. The prognosis for the milder form is good, for the severe, generalized form guarded, but a certain amount of improvement is always to be expected. For the pain the author suggests the injection of a 2 per cent. solution of phenol, with or without morphin, into the affected regions. Lunz² reports a case that was very similar to diphtheric paralysis. Fluids returned through the nose, there was difficult deglutition, diplopia, vertigo, slight facial paralysis, and paresis of all the extremities, with ultimate recovery. The author believes the greater number of these cases to be due to septic trouble, but thinks some may be due simply to the cachectic condition following confinement, and a few, not strictly in either of these classes, to a combination of physical exhaustion, psychic strain, and overloading of the blood with effete matter. Lamy³ describes three forms: the first due to direct injury of the plexus in forceps or other difficult delivery; the second, to extension of pelvic inflammation to the nerve-trunks; and the third, an infectious form that affects the upper as well as the lower extremities.

It is well known that neuritis, especially that due to toxemia, metallic or organic, may present a symptom-complex very like locomotor ataxia—pseudotabes. Gilbert⁴ reports a case of this affection supposed to have been due to the administration of mercury for syphilis. [The patient undoubtedly presented the typical symptoms of multiple neuritis, but as he improved under an active course of mercurial inunctions, with the addition of potassium iodid, and as there had been excess in alcohol (the most frequent cause of multiple neuritis) and in tobacco, we should consider the etiologic diagnosis, to say the least, as very doubtful.]

NEUROSES.

Reflex Neuroses.—Gradle⁵ tabulates the reflex neuroses and their causes (omitting the pelvic and genital organs) as follows:

STARTING-POINT.	NEUROSIS.
Anomalies of refraction and accommodation of the eye, ⁶ and some instances of anomalies of the external muscles. ⁷	Headaches, continuous or periodic. Vertigo. Nausea. Ciliary spasm. Blepharospasm and chorea of facial muscles. Epilepsy (rare).

¹ Deutsch. med. Woch., Nos. 8 and 9, 1895.

² Ibid., Nov. 22, 1894.

³ Archiv. de Toccol. et de Gynéc., Nov., 1893.

⁴ Deutsch. med. Woch., Nov. 1, 1894.

⁵ Jour. Am. Med. Assoc., June 9, 1894.

⁶ S. Weir Mitchell: Am. Jour. Med. Sci., April, 1876; Gould: Ibid., Jan., 1890, and Med. News, Aug. 23, 1890.

⁷ Stevens: Functional Nervous Diseases, 1887; Burnett: Trans. Am. Oph. Soc., 1891.

STARTING-POINT.

Diplopia from insufficiency of one of the external muscles of the eye.

Nasal disease² and suppuration of maxillary sinus.³

Ears.

Pharynx and faucial region.²

Teeth.¹³

Stomach¹⁵ and intestinal tract.

Painful peripheral cicatrices.

NEUROSIS.

Deviation of the head simulating wry-neck.¹

Lachrymation. Discomfort in eyes and lids.⁴ Scotoma fugax (blind headache).² Vasomotor disturbances of lids and face.² Headaches.² Neuralgia of branches of trigeminus. Vertigo. Facial spasm.⁵ Cough.⁶ Spasm of glottis.² Asthma.^{2,7} Nightmare. Epileptiform convulsions.⁸ Functional cardiac disturbances.⁹ The symptoms of exophthalmic goiter.¹⁰

Vertigo. Nystagmus.¹¹ Cough (rare).

Cough. Epilepsy.¹² Spasm of glottis. Morning vomiting.¹²

Neuralgia of trigeminus. Otalgia. Headaches. Facial spasm. Epileptiform convulsions.¹⁴

Headache. Vertigo. Trigeminal neuralgia.¹⁶ Visceral neuralgias. Cardiac and circulatory disturbances. Epileptiform convulsions.

Epilepsy.¹⁷

The author thinks that, as a rule, the reflex origin of a neurosis can only be proved by its cessation after the elimination of the cause. He says that

¹ Nieden: *Centralblatt f. Augenheilkunde*, Nov., 1892; E. G. Colburn: *Proceedings of the Ophth. Section Am. Med. Assoc.*, 1893.

² W. Hack: *Berliner klin. Wochenschrift*, 1882, No. 25, and *Ueber eine operative Radicalbehandlung bestimmter Formen von Migräne, Asthma, Heufieber, sowie zahlreicher anderer Erscheinungen*, Wiesbaden, 1884; Schaeffer: *Deutsch. med. Woch.*, 1884, pp. 357 and 376; Sommerbrodt: *Berlin. klin. Woch.*, 1885, Nos. 10 and 11; complete summary by J. A. White: art. "Neuroses of the Nose," etc., in vol. ii., *Burnett's Syst. of Dis. of the Ear, Nose, and Throat*, 1893.

³ Scheinmann: *Berlin. klin. Woch.*, 1893, Nos. 49, 50, 51.

⁴ Gruening: *Med. Record*, Jan. 30, 1886. Gradle: *Proceedings Ophth. Section Am. Med. Assoc.*, 1892, *Jour. Am. Med. Assoc.*, Sept. 10, 1892.

⁵ Peltesohn: *Berlin. klin. Woch.*, 1892, No. 32.

⁶ I. N. MacKenzie: *Am. Jour. Med. Sci.*, July, 1883.

⁷ Bosworth: *Diseases of the Nose, etc.*, 1889.

⁸ Finke: *Deutsch. med. Woch.*, 1885, No. 4; Schneider: *Berlin. klin. Woch.*, 1888, No. 42.

⁹ Kuepper: *Deutsch. med. Woch.*, 1884, p. 828; v. Stein: *Monatsschrift f. Ohrenheilkunde*, 1889, Nos. 9 and 10.

¹⁰ Hack: *Deutsch. med. Woch.*, No. 25; Musehold: *Ibid.*, No. 5, 1892.

¹¹ Kipp: *Trans. Am. Otol. Soc.*, 1888; Cohn: *Berlin. klin. Woch.*, Nos. 43 and 44, 1891.

¹² Personal observation.

¹³ *Résumé* by A. P. Brubaker, art. "Reflex Neuroses," in vol. iii. of *Litch's Am. System of Dentistry*.

¹⁴ Liebert: *Deutsch. med. Woch.*, 1885, p. 643.

¹⁵ Trousseau: *Medical Clinic*, Sydenham Translation, vol. iii. and vol. i., art. "Epilepsy."

¹⁶ Gussenbauer: *Prager med. Woch.*, 1886, p. 31.

¹⁷ A. R. Bowlby: *Injuries and Diseases of Nerves*, 1889; W. Rose: *Brit. Med. Journal*, 1889, p. 475; Gallerani and Raciotti: *Neurolog. Centralblatt*, 1893, p. 479.

in nervous disease from heterophoria exclusion of one eye by a shade will relieve the condition; [but this is denied by Stevens.] When refractive errors are the cause of the trouble, rest of the eyes with paralysis of accommodation will bring relief, and when the nose is at fault the application of cocaine is often efficacious. In considering these cases we must beware of *post hoc ergo propter hoc* reasoning, as "suggestion" plays an important rôle in many neuroses, and familiarity with the different neuroses is necessary to make conclusions valid, not only because an accurate diagnosis must be made, but the observer must be in a position to compare this treatment with others in analogous cases. The author has never seen a case of nervous disease from ametropia in which questioning did not elicit the admission of more or less trouble with the eyes themselves. We quote: "A clear insight into the pathogenesis of reflex neuroses can only be obtained by an analysis of all the factors concerned in their production. For evidently the peripheral anomaly starting the neurosis is but one of the factors, or why should a patient with nasal polypi have asthma, when so many others suffering from the same nasal condition escape the secondary affection? Why should but a small number of hypermetropic people get headaches, while the majority of eyes with this deficiency cause only disturbed vision and nothing else? If an irritation alike qualitatively and quantitatively produces disturbances in the nervous system of but one person out of many, there must be special reasons for this exceptional result. Unfortunately, our knowledge of the conditions determining a neurosis is as yet but very meager.

"In a fair proportion of these sufferers we can recognize hereditary influences. In my inquiries into the family histories in cases of ocular and nasal neuroses I have very often found similar affections in different members of the family. In the sensory neuroses, and especially those of ocular origin, I have learned to regard as important factors the pernicious results of in-door confinement in cities. My case-book contains numerous records of school-children and young clerks whose headaches or dizziness or other sensory discomforts were for the time being checked by glasses of moderate strength, but who were equally comfortable without their glasses after a thorough vacation. It is especially during the growing period of life that want of out-door exercise and close confinement increase the liability to reflex disturbances. Chlorosis also has its share in the etiology of these affections, and when the history shows that the nervous disturbances, although clearly of peripheral origin, have only begun since anemia was manifested, iron and hygienic directions are often as serviceable as the correction of the peripheral cause. The history of some cases shows that the sensory neurosis dates back to the time of recovery from some acute fever—measles more often in my experience than any other. I have also noticed relatively often that headaches of refractive origin began during the lactation of mothers. In two instances of nasal neuroses observed by myself excessive smoking seemed to be a predisposing condition, and moderation of this habit relieved the intensity and frequency of the attacks. One of the patients had short

attacks of dyspnea with palpitation of the heart, and was ultimately cured by operations restoring the patency of the nose. The other one had periods of cardiac irregularity and acceleration, presumably due to papillomata in the nose, but the diagnosis was not made certain by his refusal of the operation."

"A factor to which but little attention has yet been called is the coexistence of several sources of irritation in the system. I. N. MacKenzie¹ has observed that nasal neuroses are often most pronounced during menstruation, and that they can be exaggerated by sexual excesses. It is well known that migrain accompanies the menstruation of some women. In a few instances of migrain especially accentuated during such times I have proved the ocular origin by successful correction with glasses. Several cases of asthma, the nasal origin of which was shown by the ultimate relief given by nasal surgery, have given me the history of attacks induced particularly during times of intestinal distress, and in these patients dietetic management had a distinct influence on the frequency of the asthmatic attacks. It is common experience, too, that pregnancy predisposes some women to serious nervous symptoms. In some instances of facial neuralgia, of scotoma fugax, and of circulatory disturbances in pregnant women the nasal origin was strongly suggested by the history of the nasal distress, although I have only twice demonstrated the relationship by the success of intranasal operations. It should be remembered in this connection that nasal operations have several times been followed by miscarriages."

"It must finally be admitted that in many instances of neuroses of peripheral origin no accessory influences, no disturbances of nutrition—in fact, no deviation from perfect health of the nervous system—can be detected. Indeed, this seems to be the case in many of the more typical instances in which the elimination of the starting-point stops at once all nervous symptoms. On the other hand, whenever the history shows fluctuation in the intensity of the nervous troubles and periods of intermission it is more likely that the peripheral cause has been aided in its influence upon the nervous system by accessory baneful circumstances, without which it would not have sufficed to induce the neurosis. These considerations explain also why some neuroses cease spontaneously, in spite of the persistence of the peripheral cause, while others never stop until the starting-point is removed."

Chorea.—Knapp² reports 8 cases treated with quinin, as advocated by Wood, although the doses (from 6 to 18 grains daily) were rather less than those recommended. Although 1 case recovered in a week, the author does not find the method satisfactory. In 5 cases the treatment was ineffective, and arsenic was substituted with benefit.

Epilepsy.—[There has been of late years a very general movement, embracing all the more civilized countries, to provide for that unfortunate class, epileptics. The United States has not been behind; much has been accom-

¹ Am. Jour. Med. Sci., April, 1884.

² Boston Med. and Surg. Jour., Feb. 28, 1895.

plished, and the promise for the future is bright. Most of the existing and proposed institutions are modelled after the colony at Bielefeld, Germany, but a visit by the writer convinced him that it could be greatly improved upon by making the medical element more prominent. Still, such an institution must be essentially a school (industrial and otherwise), and next a home with home advantages and attractions. There are at present institutions (all of them inadequate) in Ohio, Maryland, Massachusetts, and California. The New York colony, which will probably excel all others, is not yet in operation.] Several papers on the subject have been contributed.¹

[As to treatment, among the arsenal of remedies directed against epilepsy, many of which are found to be useful in certain cases, the bromin preparations stand *facile princeps*; but it cannot be denied that they often leave much to be desired, and so at different times clinicians have combined them with other drugs—a plan that is frequently found to be of distinct advantage. Calabar bean, picrotoxin, belladonna, and digitalis have been found of use. Flechsig's method has been found to be of signal advantage at times.] Collins,² after a trial of the Flechsig plan³ in 50 cases reached the following conclusions: 1. The plan suggested by Flechsig is not a specific in the treatment of epilepsy. 2. In almost every case in which this plan of treatment has been tried there has been a cessation of the fits for a greater or lesser time. 3. A relapse generally occurs in a period varying from a few weeks to a few months. 4. The frequency of the fits after the exhibition of the opium is, for the first year at least, lessened more than one-half. 5. The attacks occurring after the relapse are much less severe in character than those that the patient has been accustomed to having. 6. This plan of treatment is particularly valuable in ancient and intractable cases. 7. In recent cases of idiopathic epilepsy it cannot be recommended. 8. The opium-plan of treatment is an important adjuvant to the bromid-plan as ordinarily applied. 9. The opium acts symptomatically, and merely prepares the way for and enhances the activity of the bromids and other therapeutic measures. 10. This plan of treatment permits the use of any other substances known to have a beneficial action in epilepsy.

At the last meeting of the Illinois State Medical Society, Dr. Boody of the Kankakee asylum reported⁴ the results of the Flechsig treatment in 26 cases, with, on the whole, excellent results, and in some instances the patients were apparently cured. Putnam⁵ has tried the method in 5 cases with good results, although in none were the attacks wholly stopped; and Drewry⁶ says he has found it of service in *grand mal*, but gives no report of cases.

¹ Letchworth: Buffalo Med. and Surg. Jour., Aug., 1894; Drewry: Virg. Med. Monthly, Sept., 1894; Spratling: Med. News, Sept. 15, 1894.

² Med. Rec., Sept. 22, 1894.

³ This consists in the administration of the extract of opium for six weeks, the dose being rapidly increased from gr. $\frac{1}{4}$ to gr. v three times a day, when the drug is stopped, and half a dram of bromid three times a day substituted (Neurol. Centralbl., 1893).

⁴ Trans. Ill. State Med. Soc., p. 266, 1895. ⁵ Jour. Nerv. and Ment. Dis., Jan., 1895.

⁶ Virg. Med. Monthly, Sept., 1894.

Peterson¹ endorses it, saying, "it has proved a very efficacious means of treatment in obstinate cases when all else seemed to fail." Wulff² reports better results with this method than with any other line of treatment. Of 17 cases, in 5 the attacks ceased altogether, in 8 there was decided improvement (one-eighth to one-third the former frequency), and in 4 there was no improvement. Bechterew³ has highly praised a combination of bromid with *Adonis vernalis*. He⁴ uses a mixture of 2 to 3 drams of the bromids in 6 ounces of infusion of *Adonis vernalis* of a strength of $\frac{1}{2}$ to 1 dram of the drug to 6 ounces of water, and administers from 4 to 8 tablespoonfuls daily. Two or 3 grains of codein are often added to the mixture. He has used this remedy for many years and claims excellent results. Only 2 cases are fully detailed, but they show a decided improvement over the results obtained by the straight bromid treatment.

[These two methods seem worthy of further trial, and we would advise, in cases in which a thorough and intelligent use of the bromids alone is not found satisfactory, the Flechsig or Bechterew mixed treatment, giving the preference to the former.]

In the treatment of epilepsy bromalin has been recommended by Féré and by Laquer in doses of from $\frac{1}{2}$ to 2 drams.

Tenotomy of the Eye-muscles for Epilepsy.⁵—The following conclusions of this most excellent paper are so reasonable that we heartily endorse them: "1. Heterophoria in some form, latent or manifest, can be shown to exist as an ocular condition in fully 95 per cent. of all individuals. 2. Alone and when associated with ametropia it is not an uncommon cause of so-called asthenopia. 3. In the latter case the correction of the accompanying refractive error in the large majority of cases relieves all the symptoms set up, both by the ametropia and muscular anomaly; when it does not, the heterophoria may be said to be responsible for the asthenopia. 4. It is highly probable that when epilepsy is in part or wholly the result of eye-strain, other evidence of the latter is present. 5. It must follow from the foregoing that in the eye-treatment of epilepsy of any decided degree the correction of the ametropia, and not the correction of the heterophoria, is the first and most urgent duty of the ophthalmologist, and that in cases in which both are corrected at the same time it is fair to suppose that the results, if any, are due to the ametropic correction. 6. In cases of epilepsy with heterophoria and emmetropia, or when the correction of refractive errors has failed to relieve the asthenopic symptoms, and the production of orthophoria is followed by cure of the epilepsy and the asthenopia, it is just to say that the operation on the eye-muscles or treatment of them has produced the effect of stopping the convulsions. 7. In the absence of ocular symptoms, apart from the epilepsy, an operation upon the eye-muscles stands in the same therapeutic relation to a cure or relief of the disease as do other surgical

¹ Amer. Medico-Surg. Bull., Feb. 1, 1895.

² Neurolog. Centralbl., June 1, 1895, p. 525.

³ Ibid., Dec. 1, 1894.

⁴ Loc. cit.

⁵ Casey A. Wood: N. Y. Med. Jour., July 7 and 14, 1894.

procedures that have during the past century been in vogue, such as tracheotomy, setons, ligature of the vertebral arteries, trephining, oophorectomy, circumcision, castration, the actual cautery, the resection of stray scars, and so on. 8. These operations bring about a cure or relief of the epilepsy (both idiopathic and hysterioepilepsy) by their powerful mental effect upon the patient—a truth long recognized by neurologists. 9. Genuine cures of epilepsy by eye-treatment of any kind must necessarily be confined to those cases in which a faulty ocular apparatus acts as a peripheral irritant. It remains yet to be shown that anomalies of the extrinsic muscular portion of that apparatus are to any large extent responsible for the seizures of epilepsy. 10. The eye-treatment of epileptics who present signs of ocular distress has not received that attention which the importance of eye-strain in the category of reflex irritants seems to call for. The eyes should be carefully examined in every case of epilepsy in which asthenopic symptoms are present or are suspected. 11. I question the wisdom of encouraging the profession, and through them the laity, to believe that *every* case of idiopathic epilepsy is a suitable one for eye-treatment, but prefer to say that only those cases are fit subjects, in the proper scientific sense, for eye-treatment whose visual organs are palpably the source of irritation, giving rise to symptoms generally included under the term eye-strain. 12. That when all remedies fail some such operation as Reynolds suggests—easy to perform, perfectly safe, and yet of a severity and character tending to make a lasting impression on the patient's mind—is indicated. I would suggest the removal, at intervals, of small pieces of skin from various parts of the body, the denuded spots being allowed to heal by granulation."

Treatment of Traumatic Epilepsy.—Darby reports 3 cases. In the first a man had carried a bullet in the left side of his neck for twenty-two years without symptoms, when he began to have peculiar "nervous spells" whenever he attempted to sleep on the right side. These are said to have developed into epilepsy, from which he had suffered for three years when the bullet was removed, and at the end of a year the fits had disappeared. [It is very doubtful if the fits were epileptic, and equally doubtful is the relation of the operation to the recovery.] The second case was of a young man of nineteen who had received a depressed fracture of the parietal bone at the age of four. At sixteen fits began and increased in severity. When he was trephined the only lesion found was adhesion of the dura to the bone. There was complete recovery [but the remark made regarding the foregoing case will apply here]. In the third case operation was too recent to judge of the result, and, besides, the patient was taking large doses of bromids. [The only lesson to be learned from these cases is that prevention is better than cure, and that in every case of injury the surgeon should see that all is right before discharging the case.]

The Reflexes in Epilepsy.—Donaggio¹ examined 32 cases in the interval between the attacks, and found the knee-jerk exaggerated in 15, of medium

¹ Rivisti Sper. di Fren. e di Med. Leg., 1894, fas. i.

activity in 8, diminished in 7, and absent in 2. Of the 15 in which it was abnormally brisk, in 10 it was more exaggerated on the right side and in 5 on the left side. The other tendon-reflexes were exaggerated in a smaller proportion of the cases, and the superficial reflexes were in the majority of the cases diminished.

Jacksonian Epilepsy from Gastrointestinal Infection.—Cristiani¹ had a case of a man of fifty-two, strong, of good family history, who had for years suffered with gastric and intestinal indigestion and various functional nervous troubles—melancholia, hypochondria, irritability, headache, vertigo, and various paresthesiæ. He was finally attacked by spasms of the right side, preceded by paresthesia, and lasting five to fifteen minutes. The author finds the cause in intestinal intoxication, but he fails to adequately exclude hysteria.

Hemipic Sensory Epilepsy.—[In hemianopia from whatever cause it is not rare to observe hallucinations of sight in the hemianopic field, as it is not rare for migraine to be complicated with hemianopia and scintillating scotoma, but these hallucinations are generally very simple in character—flashes of light, moving figures, etc.—and more or less transitory.] Lamy² reports a case in which the patient always saw the same smiling face of a child which looked at her. The vision occurred as part of a short “absence” (*petit mal*) which recurred frequently during more than a year, and it was always in the hemianopic field. The author calls the case one of sensory epilepsy allied to Jacksonian epilepsy.

Treatment of Neurasthenia.—Inequality of the pupils, although generally considered as a sign of organic disease, Kraus³ finds in all cases of neurasthenia in which there are vasomotor disturbances. He has also observed in these cases an icterus that comes on suddenly and often subsides in a few days without treatment, and refers it to some disturbance of the vagus influence on the liver. For treatment the cases are divided into three classes—the lithemic, nonlithemic, and vasomotor. The first two are divided into asthenic and sthenic. To the first of these he gives 2 ounces of black coffee before rising, followed by a tepid sponge-bath and breakfast. The sthenic cases receive at the same hour from $\frac{1}{2}$ to 1 ounce of a saline cathartic and a cold sponge- or plunge-bath. Electricity is employed in all cases—a mild galvanic current through the spine and head, and a strong faradic current through the arms from the hands. Sometimes massage and graduated exercise are added. To the lithemic cases he gives a tablet of lith. carb. 3 gr., ferri phos. $\frac{1}{8}$ gr., ext. nuc. vom. $\frac{1}{8}$ gr., sod. arsen. $\frac{1}{27}$ gr. One to three tablets after meals. In the nonlithemic cases bromids and hyoseyamus are given with a tonic of iron, nux vomica, and phosphoric acid in pepsin cordial. For a hypnotic, trional in doses of from 5 to 10 gr. is preferred. The vasomotor cases are the most intractable, and the author confesses his inability thus far to discover a satisfactory method of treat-

¹ Rivisti Sper. di Freniatria e di Med. Leg., vol. xix. fas. iv.

² Arch. de Neurol., Oct., 1894.

³ Buffalo Med. and Surg. Jour., Oct., 1894.

ment. Electricity, strophanthus, rest, and out-of-door life have given the best results.

Malarial Neurasthenia.—Triantaphyllides bases a paper on this subject¹ on 50 cases observed in Batoum, at the eastern end of the Black Sea, where malaria is very rife. The neurasthenia may be the first and only manifestation of the paludal poison, and ranges in degree from simple malaise, mental and physical, frequently associated with hot head and hands, to the most extreme prostration, with marked psychic and somatic disturbances. The symptoms are in general those of neurasthenia from other causes, but the author has noted what he considers to be peculiarities due to this etiology. Among these may be noted the following: Nocturnal attacks of agitation and excitement; the intellectual torpor is greatest during rest; if the subject force himself to labor, his mental powers are found to be about normal; in spite of great amyosthenia the dynamometer registers normal strength; anemia plays no part in the genesis of the affection; in addition to the ordinary spinal tenderness, and more frequent and severe than this, is an umbilical area of tenderness (43 cases out of the 50). The diagnosis is made by the presence in the blood of the plasmodium malarie (41 of the 50), and by the result of the treatment, nearly all of the cases recovering on the administration of quinin, preferably the bisulphate hypodermically in doses of from 9 to 15 gr. Relapses, however, are frequent so long as the patient resides in a malarial locality.

Trephining for Neurasthenia.—Levillian² reports the case of a boy of fifteen who had been troubled for three years with constant and severe headache, increased by mental exertion, incapacity for mental labor, vertigo, insomnia, morning amyosthenia, stomach-troubles, and constipation. A depression was found in the parietal region 9 centimeters long, 5 broad, and 8 millimeters deep, and after the operation on this site there was complete recovery, due, the author thinks, to relief of the cephalalgia, allowing the general condition to improve. But in the discussion Ballet called attention to the fact that neurasthenia as well as hysteria is sometimes cured by the mere shock of the operation, and quoted a case in which a cure followed an operation for floating kidney, although no floating kidney was found.

Anxiety-neurosis.—Freud³ proposes to separate from neurasthenia a symptom-group to which he gives this name.⁴ This neurosis may present a complete or an incomplete clinical picture; may occur alone or in combination with other neuroses; and is characterized principally by the following symptoms: 1. General irritability of the nervous system, manifested especially as an auditory hyperesthesia; a hypersensitiveness to noise, which is frequently the cause of insomnia, more than one form of which Freud reckons as belonging to this affection. 2. Anxious apprehension, the patient ascribing a dreadful importance to trivial circumstances. This symptom shades off on one side into a not abnormal anxiety, on another into hypo-

¹ Archives de Neurol., Aug., 1894.

² Ibid., Oct., 1894.

³ Neurolog. Centralbl., Jan. 15, 1895.

⁴ Angstneurose.

chondria, and on still another into a hyperconscientiousness, which may develop into a veritable insanity of doubt. In this symptom really lies the nucleus of the disease. Given an inherent exaggerated anxiety, an excessive apprehension, the manifestation will depend largely on any fortuitous conception. The "anxious fit" may be manifested almost entirely by somatic disturbances without the intervention of ideation—viz. by palpitation, perspiration, dyspnea, bulimia, pseudoangina pectoris, tremor and shaking, and so-called congestive attacks. The attacks may also take the form of the night-terrors of adults, and of dizziness varying in degree and character, but never sufficient to cause the patient to fall. Of two groups of "phobias," the first—the fear of vermin, storms, darkness, etc.—is born of a chronic apprehensiveness; the second—agoraphobia and its congeners—takes its rise in a tendency to vertiginous attacks of anxiety. Any of these symptoms may become chronic, especially the dizziness, diarrhea, and paresthesia.

The etiology of this neurosis, according to the author, lies almost wholly in some abuse or deep impression in connection with the sexual function, and he makes the following etiologic classification of the cases: For women, (1) anxiety of adolescence, or virginal anxiety, caused in maturing young girls by the sudden presentation or solution of the sexual problem; (2) anxiety of the newly-married, occurring in young wives who are at first anesthetic to intercourse, but in whom the somatic processes of intercourse are complete; (3) anxiety of wives whose husbands are more or less impotent; (4) anxiety of those whose husbands indulge in incomplete coitus; (5) anxiety of widows and those who restrain the sexual impulse; (6) anxiety of the menopause, and period of final exaggeration of the sexual instinct. For men, (1) anxiety of the continent; (2) anxiety from unnatural sexual excitement with ungratified desire; (3) from indulgence in *coitus interruptus*; (4) of men who pass through a climacteric with increased desire and diminished virility. Two classes of cases include both sexes: (1) Neurasthenics from masturbation become victims of the "anxiety neurosis" on relinquishing the vice, but this applies, in men, only to those who are still potent. (2) The disease may be caused by overwork, worry, etc., without any apparent sexual influence.

The author then cites clinical evidence in support of his conclusions as to the etiology, and follows this with an explanation of the psychic processes by which the neurosis arises from these etiologic factors. [The explanation, however, appears to us labored and far from satisfactory, and may, we think, be neglected until his clinical postulate has received further support. The relations of this neurosis to others are intimate; in the majority of cases it is combined with one of them, but the author insists that in such instances several specific causes can be traced. Thus, a woman always hysterical indulges in *coitus reservatus*, and has added to her hysteria the "anxiety neurosis." A male, neurasthenic from masturbation, enters into unnatural sexual relations with one of the opposite sex, and acquires in addition the corresponding specific neurosis. On the whole, this symptom-group most closely resembles hysteria, but is more somatic in origin and mechanism.]

Singultus.—Parker¹ reports 4 rebellious cases successfully treated by dry cups applied to the abdomen. In each case it was necessary to repeat the application after two hours, but recovery was then rapid. Tatevosoff reports a brilliant cure in a patient with chronic chest-trouble from the use of common snuff, enough being given to induce lively sneezing. It had to be repeated several times. Griswold² records the successful treatment of 1 case by glonoin, $\frac{1}{150}$ gr. every three hours. The attack occurred after a debauch in a man aged fifty years. Heidenhain³ records a very severe and prolonged case caused, as shown later by the operation and postmortem examination, by carcinoma of the pancreas. The spasms were greatly relieved by cocain administered by the mouth, as high as 15 grains being given in twelve hours.

Exophthalmic Goiter.—[We can scarcely be said to *know* more of the nature of Graves' disease than a year ago, but the present tendency is to give to the thyroid gland a much more prominent place in the genesis of the affection. The study of myxedema and its treatment has had a palpable influence on the consideration of the pathology of exophthalmic goiter, and many authors now consider the disease to be caused wholly or in large part by a perverted action of the thyroid gland. This may consist in the failure to destroy the potency of supposed toxic elements generated by the organism, or a failure to normally secrete material necessary for health, or in the abnormal secretion of some substance that causes the disease.*] Maude⁵ contends that a mild grade of multiple neuritis is an almost constant accompaniment of Graves' disease, and that many of the well-known symptoms are due to this complication. [He bases his assertion on purely clinical grounds, and in our opinion refers symptoms that are distinctly due to the general conditions or cachexia to this supposititious neuritis. He supports the opinion of Marie that the knee-jerks are nearly always lessened or abolished. This needs wider confirmation and does not agree with our experience.]

Graves' Disease and Myxedema.—Baldwin⁶ reports 4 cases that tend to support the theory referred to, that exophthalmic goiter is produced by some abnormality of the thyroid gland, probably increased functional activity. All 4 patients showed the typical symptoms of exophthalmic goiter, and then, after a varying length of time, with diminution in size or entire loss of the thyroid gland, they presented a more or less typical picture of myxedema, and all were cured by the administration of thyroid extract. For the tumultuous heart's action of Graves' disease Taylor⁷ recommends the application of ice to the precordium, and for a general sedative hyoscin hydrobromate.

Hysterical Anorexia.—Brissaud and Souques⁸ propose to designate what

¹ Phys. and Surg., Detroit, Oct., 1894.

² Berlin. klin. Woch., June 11, 1894.

³ Brain, 1894, summer number, p. 229.

⁷ Med. News, Dec. 16-23, 1893.

² Jour. Am. Med. Assoc., Oct. 27, 1894.

⁴ See Putnam: Brain, 1894, p. 214.

⁶ Lancet, Jan. 19, 1895.

⁸ Nouv. Icon. de la Salp., Dec., 1894.

has generally been termed hysterical anorexia as emaciation-insanity. They contend that in the light of recent investigations, which have shown hysteria to be a mental disease, the current term is inaccurate and not sufficiently expressive. A like objection may be made to the substitutes, hysteric inanition and *sitiérgia*, proposed by Lasègue and Sollier respectively. In all cases alike, whether the appetite is lost or not, the emaciation is the sequence of a conscious or subconscious imperative conception (*idée fixe*). They support this thesis by a very full presentation of the case of a girl of nineteen years, distinctly hysteric, in which the development of the idea to grow thinner is carefully traced from its inception—a simple desire for a better form and to escape the raillery of her companions—up to its development into a complete “possession.” For three years, with only a few short intermissions, she had been unable to retain food, and had wasted to a mere skeleton (from 60 kilogrammes to 29). The skin was brown, wrinkled, and flaccid; the hair dry, with spots of alopecia; the nails furrowed and irregular; the temperature often subnormal. Isolation, mental treatment, and liberal feeding added 39 kilogrammes to her weight in three months, at the end of which time she was entirely normal in every way. In the treatment the authors lay great stress upon the necessity of substituting for the imperative conception of emaciation one of increase in weight. They further call attention to the fact that if in animals emaciation exceeds six-tenths of the initial weight, restoration is impossible, and infer that a similar law holds good for the human organism; so that there is nothing to prevent a fatal termination in extreme cases of this hysterical affection, and several instances of such termination are cited. Collins¹ reports a typical case of hysterical anorexia in a girl of seven and a half years, who on admission to the hospital weighed less than 33 pounds. Under proper treatment recovery was rapid.

An Hysterical Form of Raynaud's Disease and of Erythromelalgia.—Lévi² contributes a paper to the study of the influence of emotion on the vasomotor system, supposing erythromelalgia to be a vasomotor trouble, which is far from being proved, although it may be so in some cases. One case each of Raynaud's disease and erythromelalgia is reported in hysteric and hypnotizable subjects, presenting also abnormalities of the urinary function. By means of hypnosis it was determined that the two vasomotor disturbances were due to emotions because of a subconscious imperative conception, thus throwing light upon the pathogenesis of vasomotor neuroses of the extremities.

The author first considers Raynaud's disease, and starts with the postulate that when an affection develops in an hysteric subject and under the usual conditions of an hysteric affection, and this affection improves or disappears under the influence of hypnosis, we may call it an hysteric affection. Raynaud's disease, fulfilling these criteria, is sufficiently well distinguished from the same syndrome, nonhysteric; that is, the same affection may at

¹ Lancet, Jan. 27, 1894.

² Archives de Neurol., Jan., Feb., and Mar., 1895.

times be of hysteric origin and at times not. The case was of a peasant-woman, aged forty-three, who at forty-one had acute rheumatism; at forty-two her nervous troubles began, and two months later the first hysteric manifestation—a convulsion. Three months later was the first attack of local syncope, in the fingers, which came on suddenly on the occasion of a mental shock. Four days later the same manifestation occurred in the toes. These attacks recurred several times a day, and six weeks later there was added local asphyxia, which thenceforth accompanied the attacks. A slight anesthesia was found along the dorsal spine; otherwise no stigmata of hysteria. It required about five minutes for the development of the syncope, and after from fifteen to twenty minutes the asphyxia supervened, the attacks numbering from 10 to 12 a day, and lasting as long as one hour. The urine was diminished to an average of 6 or 7 ounces in the twenty-four hours, and sometimes none was secreted for several days. Hypnotism was used at first every day or two, and then at intervals of from eight to fifteen days, from April 1st to June 27th. By April 13th she was passing 94 ounces of urine in twenty-four hours, and a month later the quantity reached 115 ounces, but varied, increasing after the hypnosis and diminishing when the patient was depressed or discouraged. The attacks first became syncopal only, and then less frequent, but after a free interval of seventeen days there was a return, which was found by interrogation during hypnosis to be due to reading a story that reminded her of her own troubles, which she had been made to forget by suggestion during hypnosis. Two other relapses were caused by emotion, and recovery was evidently retarded by the fact that she must return to her husband, until it was suggested that it would not be disagreeable to return. The temperature in one attack reached 104° F. After her return to a troublous home the attacks became more frequent, and the urine fell to an average of 6 ounces, missing some days altogether. She again improved under hypnosis, which improvement continued. To make sure of the effect of mental impressions in producing the symptoms, it was suggested during hypnosis that her daughter was dead, and an attack began at once, which was promptly relieved by hypnosis. This was practically a repetition of an experiment made during the first hypnosis, when conversation about the mental shock which had induced the first attack caused an onset at once.

The author shows that many vasomotor and circulatory abnormalities are caused by violent emotions, and in this case the localization of the disturbance was determined by the preceding rheumatism, the vasomotor accompaniments of the latter having formed in the nervous system a "center of appeal" (an attracting center) for the hysteric manifestations; but, once started, the connection of the local syncope with the emotion became more intimate, the subconscious association more glib, until the mere thought of the cause produced the effect. This was traced by means of hypnotism, and for the gradual evolution a gradual involution established by the same means. Later, other mental causes than the original caused the attacks, the

receptivity, vulnerability, having increased; the effect of functional as of organic disease being (as Janet has shown) to diminish the normal resistance to pathologic processes. The emotion, having been transformed into a subconscious imperative conception, enters into the category of hysteria.

The phenomena of Raynaud's disease are in a very mild degree physiologic, and it is only in their exaggeration that they become pathologic. Hysterie persons are the facile subjects of strong and persistent emotions, so that physiologic vasomotor processes are easily exaggerated into pathologic. A number of cases are cited that show conclusively the hysterie origin of Raynaud's disease, and one case, that of Burot, was relieved by hypnotism. In this case the observer was able to change the temperature of the limb by hypnotism as much as 24° F. within twenty-four hours.

The history of the case of erythromelalgia is similar in every respect: A woman, aged thirty-seven, always nervous, distinctly hysterie, had acute rheumatism, and about a year later, following a period of great trouble and worry and the next day after intense and depressing emotion, her first attack of erythromelalgia, consisting of burning pains and tingling in the feet, accompanied by an abundant local perspiration, arterial pulsation, redness, and slight swelling. These attacks recurred nightly, lasting one-half to one hour, and medication afforded but slight and temporary relief. The amount of urine was subnormal—25 ounces. After a month of hypnotic treatment the patient was quite cured, and the urine increased to 50 ounces, but in the following month she had two slight attacks caused by emotions, one of sadness and one of anger. There had been no return four months later.

[These cases all tend to show that hysteria is a mental disease, the symptoms due to a psychic process which hypnotism helps us to follow. Janet says: "In every manifestation of hysteria some disturbance of the psychic functions plays an important role."]

Among the conclusions of Lévi, the following are the most important: 1. There is a certain form of Raynaud's disease that is purely hysterie. It may be born of, and reappear from, a powerful emotion, and by the transformation of this emotion into a subconscious imperative conception the disease becomes established as an entity. 2. Acute articular rheumatism is frequently found to have preceded and to serve as a localizing cause for hysterie manifestations. 3. The onset is sudden and of psychic, emotional origin, with renal disturbance—anuria or polyuria. 4. Gangrene is probably possible in this affection. 5. The examples of Raynaud's disease of hysterie or emotional origin are numerous, and may occur in several members of the same family. 6. For the treatment and etiologic diagnosis it is necessary to uncover the psychologic history of the patient. Hypnosis permits us to discover the immediate cause of the affection and to cure or relieve it.

Hysterie Polyuria.—Into the same line of thought fall the conclusions of Souques¹ as to hysterie polyuria. He claims that most cases of polyuria

¹ Arch. de Neurol., Dec., 1894.

sine materia are due to hysteria, and that the origin is to be found in an imperative conception. A man of thirty-seven, a drinker and hysteric, came under treatment for diabetes insipidus, the urine for twenty-four hours amounting to about 34 pints. Thirst was imperious and almost constant. The beginning of this polyuria was traced to the increased urination following the "sprees" in which the patient frequently indulged. The large amount of urine excreted attracted his attention, and he began to brood over it. Following a traumatism of the head, the patient had a short attack of what was probably delirium tremens, and as the delirium passed off he was troubled with an intense thirst and correspondingly copious micturition. He had also at this time two hysteric attacks. The urine now never fell below 30 pints in twenty-four hours, and the case was at first regarded as one of traumatic diabetes insipidus. He was treated solely by suggestion during hypnosis—13 sittings in one month, when the quantity of urine voided in twenty-four hours had fallen to about 6 pints. He was kept in the hospital two months longer without any treatment whatever, the quantity remaining between 6 and 7 pints. The author agrees with Potain and Mathieu, that many cases of traumatic and alcoholic polyuria are really due to hysteria. He ascribes an etiologic role in some cases to a previous incontinence of childhood, but, whatever the determining cause acting on a neurotic base, the process is always psychic, the development of an imperative conception (generally subconscious), which reacts on the renal circulation and secretion.

Hysteric Hemianopia.—Janet¹ reports very fully a most exceptional case. Perimetric examination showed a binasal hemianopia, but with both eyes open the patient saw only to the left, the right half of the field being blank. This seeming paradox was explained by the fact that in binocular (?) vision she suppressed the image of one eye (the right), as does a patient with strabismus or a marked refractive error on one side. The hysteric character of the hemianopia was shown by the following evidence: 1. The patient was profoundly hysteric, stigmata and other symptoms abounding. 2. The fact already alluded to, that the ordinary vision did not correspond to the fields. This is in harmony with what is known regarding hysteric amblyopia and dyschromatopsia. 3. Preceding the appearance of the hemianopia the patient had displayed, alternately or combined, a hemimacropsia, hemimicropsia, and hemidiplopia monocularis of the same half of the field. These manifestations are always hysteric. 4. The subconscious field could be demonstrated to be almost normal in extent. This was done by suggesting to the patient during hypnosis that as soon as she could see a paper on the face of the doctor she would raise the arm. Then, being awakened from the hypnosis, as she looked at him, seeing only one-half of his face, a piece of paper was gradually approached to the invisible half. As soon as it touched the face she raised the arm, although not conscious of the movement nor of seeing the paper. 5. The hemianopia was rapidly cured by hypnotism.

¹ Arch. de Neurol., May, 1895.

The author has also produced a hemianopia by suggestion in very susceptible subjects. Regarding the ordinary contracted visual field of hysteria, he again calls attention to the fact that this field, even when almost normal, may be made to contract by causing the patient to strongly concentrate the attention on the central point.

Mitchel and de Schweinitz¹ have also observed hemianopia in hysteria, and in a number of cases one-half of the field was more contracted than the other, the more contracted half generally corresponding to a hemianesthesia. The foregoing cases, with 2 of homonymous hemianopia in neurasthenia recorded by Dejerine and Vialet,² are, so far as we know, all that have been recorded as occurring in functional disease.

Hysteria of Infectious Origin.—Grasset³ reports several cases of hysteria following infectious disease, and formulates an hypothesis as to the pathogenesis of cases of this character. He claims that they are the direct result of the infectious action of the microbes or their toxins, which can just as well act on the nervous system to produce a functional as to produce an organic affection, which latter action has long been recognized; and he denies the necessity of an intermediate psychic step, a suggestion, or imperative conception.

This hypothesis need not conflict in the least with the idea of the unity of the "great neurosis," or with previously allowed etiologic factors, as heredity; for, while recognizing a clinical unity, one may admit different types. As it is impossible to deny that traumatic hysteria presents a distinct type, notably in its persistence and the tenacity of its manifestations, so also does toxic and infectious hysteria present a sufficiently distinct clinical picture, and this picture is often that of the well-known nervous symptoms of various poisons—from lead, wrist-drop; from mercury, tremor; in the hysteria of syphilis, headache; in the malarial form, intermittence—and the explanation is that the poison acts directly on the centers usually attacked, but in a degree only sufficient to produce a functional or dynamic trouble, instead of the usual organic degeneration or inflammation. Hysteria is a neurosis embracing the entire nervous system, the seat of predilection being sometimes in this part, sometimes in that, and according to the seat so will the symptomatology be. [This is an old conception of hysteria, and seems to be giving way to the more modern idea (Janet, Möbius, Freud) that it is essentially psychic in nature. In addition to the metallic poisons, hysteria may be caused by the most various infections—infection from without and autoinfection, especially from the gastrointestinal tract.]

Treatment of Hysterical Attacks (Convulsions).—Balde⁴ reports 2 cases in which forcibly drawing out the tongue succeeded in cutting short the attack when all other measures had failed.

¹ Jour. Nerv. and Ment. Dis., Jan., 1894.

² Soc. de Biologie, Paris, 1894.

³ Nouv. Montpellier médical, May 26, 1894, and June 2, 1894.

⁴ Gaz. des Hôp. de Toulouse, July 28, 1894.

Hysteric Hemiplegia (Apoplexy) from a Lightning Stroke.—Camby¹ relates the case of a neuropathic woman of thirty-eight, 2 of whose children were killed by lightning in her presence. She herself was unconscious for four days, and when she recovered consciousness, was found to be hemiplegic and hemianesthetic on the left side. She fully recovered in three weeks. Two years later, during a thunder-storm, when there was no question of a lightning stroke, she had a similar attack, and three years after this a third attack under similar circumstances.

Relapsing Hysteric Gangrene.—Ehrl² reported 2 supposed cases of this affection occurring in sisters. The elder and first attacked was under observation for fifteen months, a good portion of the time in the hospital, and, although deception was thought of, it was thought to have been safely excluded. Later both cases came under the care of Dr. Nareth, who discovered that the lesions were factitious, the patients having produced them by the surreptitious application of hydrochloric acid or caustic potash. He presented the one patient to the Society of Physicians of Vienna³ with the lesions of various degrees described by Ehrl, all of which had been produced in his presence. He also reported a similar case in which the gangrenous sores had been produced by binding on Paris green, and which had been for a long time considered to be of an hysteric nature. A case quite analogous is related by Krecke.⁴ A woman of sixty-one years, of neurotic history and bearing hysteric stigmata, had been treated for thirteen years by various physicians in different clinics for a severe ulcerative skin-affection, which was finally found to be produced by the application of caustic potassa.

[These cases again impress the lesson that although most hysteric symptoms are not due to simulation, all peculiar cases, especially those occurring in hysteric subjects, must be carefully and critically studied.]

¹ Soc. méd. des Hôp., Paris, May 25, 1894.

² Wien. klin. Wochens., May 3, 1894.

³ Neurolog. Centralbl., May 15, 1895.

⁴ Münch. med. Wochens., Jan. 22, 1895.

DERMATOLOGY AND SYPHILIS.

BY W. A. HARDAWAY, M. D., AND C. F. HERSMAN, M. D.,

OF ST. LOUIS.

DERMATOMYCOSES.

Favus.—Pick¹ in 1891, in his studies on favus, reached the following conclusions: 1. That the fungus derived from the scutula of the scalp is capable of producing a severe favus when inoculated upon portions of the skin free from hair, and that this epidermis-inoculation runs its course preferably in the herpetic form. 2. The fungus from the same source after culture upon agar is also capable, when the epidermis is likewise inoculated, of producing the same disease and with the same clinical picture. 3. That the fungi-culture from these two sources coincides in every respect with those from the diseased areas of the head.

From clinical and experimental observations he also concluded: 1. That the development of the scutula is not necessarily associated with the presence of hair-follicles. 2. The development of the favus herpeticus is dependent upon the character of the skin and the mode of conveyance of the fungus. 3. Besides the favus scutularis and favus herpeticus there is a third form, favus maculosus, which is analogous to herpes tonsurans maculosus in the acute form, and sometimes occurs over the entire body. It is due to the same fungus as the foregoing forms. Pick still adheres to these opinions, and since the perfection of methods of isolating and culturing the fungus he meets with complete concurrence in this opinion, that "favus as found in man must be regarded as a clinical unity, and that the disease is produced by a *single*, specific fungus, the achorion Schoenleinii."

[With the trichophyton, however, it is not so clear. What we regard as tinea trichophyton includes too great a symptom-complex. Between herpes tonsurans vesiculosus, eczema marginatum, kerion Celsi, and the nodular trichomycosis barbæ the differences are too great to regard them all as a clinical unity. The causes of such differences may lie in the idiosyncrasies, the habits, and the constitutional differences of the patient, and in part in the anatomic and physiologic differences of the part affected, but they may be produced also by different fungi. This latter Pick believes to be the case, judging from the results of his experiments upon eczema marginatum and the nodular trichomycosis barbæ. The finding of several species of trichophyton fungi by

¹ Archiv f. Dermatol. u. Syph., Bd. xxix. Heft 1.

different workers must still be received with considerable reserve, as we do not yet possess any analytic isolation or good culture-methods for this fungus, and it is through these alone that the question can be solved. As regards pityriasis versicolor, we are still in the same position, neither have there been any new clinical observations, nor have the cultures proved successful.]

Pityriasis resembling Infantile Syphilis.—Fournier¹ records the case of an infant six weeks old who was suffering from an eruption situated on the legs and thighs, consisting of large circinate elements of a grayish color surrounded by a very marked erythematous zone. The eruption had appeared two weeks after birth and very closely resembled a syphilide. It was noticed that there were between the breasts of the mother some brown spots which proved to be due to the presence of the microsporon furfur. Scrapings from the child were examined and the same parasite was demonstrated.

The Avian Origin of Certain Cases of Trichophytosis of the Beard in Man.—Sabouraud² has found on the head and neck of a chicken a form of trichophyton that gave rise to pink cultures. The author on three occasions has found the same parasite in cases of dry trichophytosis of the beard. [It has for a long time been held that persons might acquire favus from rats, cats, and other animals known to be subject to the disease. Indeed, Dr. Leslie Roberts has recently claimed that the whole class of trichophytons are originally saprophytes.]

Varieties of Trichomycosis.—Beclere³ states that in two hundred children suffering from trichomycosis a microscopic examination has shown the presence of at least two distinct parasites. The one was characterized by small spores arranged in a mosaic around the hair, the other by large, chain-like spores in the interior of the hair. The author agrees with Sabouraud that the latter form may still further be divided into several varieties. It is possible to make a clinical diagnosis between the large-spored and the small-spored forms.

Trichorrhexis of the Hair in the Women of Constantinople.—Hodara⁴ states that trichorrhexis is quite common among the women of Constantinople, although the affection of the beard, often seen in Europe, is rare. The disease begins as small nodosities at the free end of the hair, which gradually form at points nearer the root. The hairs split and become very brittle, and break off at the nodes. Bacteriologic examination always revealed the presence of a small, rod-shaped bacillus with rounded ends. Pure cultures of this organism were obtained on agar-agar, and when the hair of a healthy girl was smeared with the culture the disease in its ordinary clinical form was produced.

Favus of the Head and Body.—Cantrell and Stout,⁵ after referring to the comparative rarity of favus, report a case in which the malady occurred both on the head and body. The patient was an Italian boy ten years old.

¹ Medical Week, July 20, 1894.

² Ibid.

³ Ibid., June 22, 1894.

⁴ Monatsh. f. prakt. Dermatol., Aug. 15, 1894.

⁵ Jour. Cutan. and Genito-urin. Dis., Sept., 1894.



Drs. Cantrell and Stout's case of favus of the head and body.

The disease had first developed two years before, during the voyage to this country. It commenced on the head, and did not spread to the body for more than a year. The whole hairy scalp was involved and covered with crusts. At the apex of the head were atrophic scars where the skin was white and shiny. On the body the disease affected especially the back and sides. There were several patches on the back, the largest being more than four inches in diameter, and the backs of the arms and legs also presented plaques of the disease. Only two or three small patches existed upon the anterior aspect of the body. At some points the characteristic cups could be very perfectly made out. Where the crusts had been removed a red, rough, atrophic condition of the skin was found. The mouse-odor was very noticeable. Microscopic examination showed the presence in the crusts of favus fungi. The authors have gathered up all the cases they could find in the literature in which the nonhairy parts were involved. There are 54 of these cases, which are divided into those in which the disease occurred only on nonhairy parts, and those located on both the hairy and nonhairy parts. The article concludes with a brief account of some experiments in inoculation of favus fungi.

In a discussion on this case at the eighteenth annual meeting of the American Dermatological Association, Dr. Stelwagon stated that the patient came under his care for treatment, and that for a month or six weeks alkaline baths and sulphur ointment were actively used. When these measures were discontinued for eight or ten days, the cups were reproduced in certain patches, although not over the whole body, and it was not until at least two months or more that the general surface was permanently cured. In this case there was no atrophy, or very little atrophy, of the nonhairy parts, but a marked staining remained that had not entirely disappeared.¹

The Plurality of Favus.—Bodin,² working in the laboratory of Besnier, has studied the favus fungus from the clinical, microscopic, and mycologic points of view. Before passing to a consideration of these points the author considers some facts bearing on etiology. Only one in twenty scalp-affections in the service of Besnier depends upon the presence of the favus fungus. Most of the cases come from the country and the suburbs of Paris. More than half of the cases gave a history of direct contagion from others affected with the disease. In a certain proportion of cases the lower animals, such as mice, dogs, rats, cats, and fowls, were suspected of transmitting the disease, but it was impossible to prove this by an examination of the animals. It is also possible that the fungus may exist as a saprophyte. Almost all of the cases were typical, but there were a few that were very unusual in their manifestations. Dubrenilh has classified these atypical forms as (1) the pityriasis form, likely to be mistaken for psoriasis of the scalp; (2) the impetiginous form, likely to be confounded with eczema of the scalp; (3)

¹ The authors wish to thank Dr. Stelwagon for his kindness in lending the negative from which the accompanying illustration was made.

² *Annales de Dermatol. et de Syph.*, Nov., 1894.

the alopeciac form, which resembles erythematous lupus of the scalp or folliculitis decalvans. The two things that especially mark this last form are the presence of a little yellowish crust about the diseased hairs and the peculiar dry, lusterless state of the hairs, which are not broken as in ring-worm. The author does not believe that we are warranted in making clinical varieties, since the elementary lesion is always the same, and since the different forms of the parasite are not uniformly associated with the various clinical aspects of the disease. This unity of clinical kind does not argue against the plurality of the fungus, for it is a well-established fact in pathology that diverse causes may produce similar symptoms, as, for instance, the aspergillus and the bacillus of Koch, both of which cause pulmonary lesions clinically alike.

The method employed by the author for the clinical microscopic examination is to immerse the suspected hairs for a short time in 40 per cent. liquor potassæ slightly heated. For permanent preservation the following method is recommended: Place the hair in alcohol and ether for twenty-four hours; then in absolute alcohol for twelve hours; the hair is placed in a cold 40 per cent. solution of potassa till it is completely cleared. The hair is then thoroughly washed in water, and then with an acid solution of potassium acetate. The hair is then colored with eosin and mounted in glycerol. In the examination only a small aperture of the diaphragm should be used. The first thing that one notices about the favus-hair is that a longer portion of the hair is invaded by the parasite than is the case of the trichophyton. Though the parasite is entirely contained in the hair, it does not completely fill it, as does the trichophyton megalosporon. The parasite pursues a peculiarly wavy course through the hair, and not all of the mycelia run in the direction of the axis of the hair, it being often possible to see some lying at right angles. Two forms of mycelia are seen—one filiform, smooth, not dividing into branches; the other more plentiful, larger, made up of mycelian-spores which branch into three or four smaller twigs. The spores not only form mycelian chaplets, but are to be seen as little heaps between the mycelia. These spores are for the most part rectangular and somewhat elongated; at times more complicated shapes are seen, but no round or oval forms occur—a fact that distinguishes this parasite from some of the trichophytions. The spores are of unequal size and are not double-contoured. Although there is the greatest variety in the microscopic appearance of the parasite, it cannot be divided into species. The author next studied the appearance and habits of the fungus on various culture-media. The medium best suited to the growth of the favus fungus is a neutral solid medium containing 5 per cent. of peptone. To start the culture, bits of a diseased hair as small as can be obtained are scattered on the surface of the medium. Potato serves very well as a medium. Cryptogamic association is always noticed in these cultures. The presence of sugar in the culture-medium favors the growth of these accidental associates. The author concludes from his observations that there are five varieties of the favus fungus: (1) The achorion Schoenleinii;

(2) an undescribed variety with brown and humid cultures; (3) an undescribed variety with brown and dry cultures; (4) *achorion atakton*; (5) *achorion enthytrix*.

The Anatomy of Favus.—Ludwig Waelsh¹ examined epilated hairs, excised portions of diseased skin and diseased finger-nails. In the hair it was found that the greatest development of the fungus lay in the infundibulum; that is, the upper end of the inner root-sheath. The fungus surrounded the hair in a thick layer that could be traced upward and downward. The fungus could also be traced a considerable distance in the extrafollicular portion. The bulb was always found free from fungi, as well as that portion of the inner root-sheath that surrounded it. The *trichophyton tonsurans* is to be found growing in the entire cortical layer of the hair. This is not so of *favus*. Though this is a considerable histologic difference, it cannot be employed for differential diagnosis, because, as was pointed out by Saint Cyr, they cannot be morphologically differentiated. This can be accomplished only by culturing.

An Epidemic of Tinea Tonsurans.—Wickham² reports an epidemic of ring-worm of the scalp that he observed in the Asylum Lambrechts. Out of 70 children, 48 were affected. The epidemic started from one case, and had already existed for six years when first seen by the author. Although the scalps of those affected had every day been washed with soap and water and once a week with mercuric-chlorid solution, the disease had nevertheless spread. In order to free the institution all the children were sent away for a month and all bedding, books, and clothing were disinfected. The children were carefully inspected before readmission, and only those who were well were taken in. After this not a single case had occurred. Clinically, the most noticeable features were the number of diseased patches presented by each case, the absence of any signs of erythema or scaling, and the small number of hairs in each plaque. The hairs were broken off close to the scalp, but were not bent or distorted. On attempted epilation the hairs broke readily. A microscopic examination revealed the hairs entirely full of mycelia made up of almost square joints and irregular-sized conidia. The fungus lay entirely within the hair. Where the end of the hair was broken off, the chains of mycelia could be seen protruding beyond the hair. These peculiarities determined the fungus to be the *trichophyton megalosporon endothrix* with resistant mycelium. The author thinks that whatever form of treatment may be used, the average time of cure of cases of this form of ring-worm cannot be reduced to less than eight months. For the cure of the few diseased hairs that remain after most of the scalp is well he would use electrolysis, electrocautery, or croton oil. The importance of a period of prolonged observation before a case is admitted among other children, after apparent cure, should always be insisted upon.

Pityriasis Nigra.—Dock³ has observed a case of *pityriasis nigra* that

¹ Arch. f. Derm. u. Syph., Band xxxi. Heft 1.

² Annales de Dermatol. et de Syph., Juin, 1894.

³ Univ. Med. Mag., Feb., 1895.

occurred in the person of a healthy man. The patient presented patches from black to yellow in color, situated mostly on the trunk and varying in size from a pea to that of the palm. The patient stated that the black patches did not come out at first yellow and then grow darker, but were black from the start. Scales from the paler regions revealed the microsporon in its usual form. In the black patches were found short, non-branching mycelia filled with dark granules. Mixed with these were a few mycelia that resembled the ordinary microsporon. No bodies that were certainly conidia could be found occurring with the pigmented mycelia. The author believes that the parasite was a modified form of microsporon.

[Dr. Leslie Roberts has shown for the trichophyton that it may be made to become pigmented by changing its habitat and surroundings, and one can well believe that the same may be true of the microsporon furfur.]

The Trichophyton Fungus.—Dr. Amedeo Marianelli¹ from his experiments and observations comes to the following conclusions in regard to the trichophyton fungus: 1. The morphologic diversity, both macroscopic and microscopic, that is observed in different colonies from different cases of the disease or in different inoculations or transplantations of the same colony, are not dependent upon difference in the species, but upon external circumstances, and principally upon the greater or less dryness of the culture-media, the age of the culture, the difference in reaction or concentration of the media, the temperature, the supply of air, etc. There is no constant correspondence between the appearance of the colony and the clinical case whence it was taken. 2. The distinction of two species based upon the size of the spores is not advisable. There are examples of the two existing at the same time, in the same person, along with the ordinary varieties. The trichophyton gigas and the trichophyton gracile are nearly always present simultaneously in onychomycosis of trichophytic origin. 3. Clinical observations point rather to a unity than to a plurality of trichophyton in man. 4. The diseased hairs as well as cultures of the parasite may retain their vitality for years. 5. Compared with other parasites, the achorion Schoenleinii included, the trichophyton will flourish most vigorously, and if existing with others will kill them. 6. If placed together with the ordinary pyogenic organisms, in case that these latter retain their full virulence they will destroy the growth of the trichophyton.

The Contagion of Alopecia Areata.—Horand² states that as yet he is unable to agree that alopecia areata is a parasitic disease, but must regard it as a trophoneurosis. Many instances of apparent infection have been reported—*c. g.* the following: Several employees of an office were affected with the disease, and it was found that a cat which had lost its hair had been in the habit of sleeping in their hats. This, however, does not prove the parasitic nature of alopecia areata, because no parasite was demonstrated on the cat, and because cats are not affected with alopecia areata. Others have

¹ La Sperimentale, fasc. v. and vi.; Jour. Cutan. and Genito-urin. Dis., July, 1894.

² Annales de Dermatol. et de Syph., Aug. and Sept., 1894.

attempted to argue the infectiousness of the malady from the fact that it commonly follows slight wounds of the scalp, which are supposed to afford doors of entrance to the parasite. The author does not believe that these are true cases of alopecia areata, but that many of the so-called cases of alopecia areata have been cases of folliculitis decalvans, which is admittedly a contagious malady. In regard to treatment, Horand has found croton oil the most efficacious drug, and he does not think it dangerous.

ECZEMA.

The Nature of Eczema.—Prof. Breda-Achille¹ in a study of the nature of eczema reaches the following conclusions: 1. One must firmly fix what conditions are to be grouped under the term eczema, in order to do away with unnecessary discussions. 2. Under the term eczema the following must not be included: erythrasma, eczema marginatum, staphylococchia (Wickham), Paget's disease, dysidrosis, mycosis fungoides in its first stage, tuberculosis cutanea in every form and stage, the different neurodermatitiden, keratodermia, the "eczematous conditions" in the sense of Brocq and Jaquet, the eczema seborrhoicum (Unna), etc. Such diseases require a position to themselves. 3. That the investigations of Gigot-Suard and Quinquand on the relations of gout and rheumatism to eczema teach us more than the theories on the parasitic origin. 4. Hereditary predisposition, a certain vulnerability in the skin *per se*, and its relations to the excretion of effete products; disturbances between the metabolism on the one side and excretion on the other—in short, biochemistry and physiology—will enlighten us more on the etiology of eczema than anything else. 5. Innervation of the skin undoubtedly plays a very important role in the origin of eczemas that are produced by external irritants. 6. The therapy exceptionally yields very useful results in forming an opinion as to the nature of eczema.

Eczema Folliculare.—Jadassohn² in a histologic study of three cases presenting the clinical aspects of the so-called "eczema-folliculare (Malcom Morris)," shows that these cases do not belong to the class of eczema. They are nothing more nor less than a folliculitis that does not undergo suppuration, and clinically the lesions are found in aggregations, particularly about the forehead. He would give these cases the name folliculitis aggregata non-suppurativa.

The striking thing about all the specimens examined was the absence of any inflammatory process in the skin between the follicles. In and about the hair-follicles and the sebaceous glands was a marked infiltration, which infiltration was made up in its center of small round cells containing round, unbroken nuclei. There was also a considerable accumulation of the so-called "plasma-cells" of Unna. The mouth of the follicles was slightly enlarged, and in many places covered by several layers of horn-like material. About the mouth of the sebaceous glands and in their immediate neighbor-

¹ Archiv f. Derm. u. Syph., Band xxix, Heft 2.

² Sep.-Abdr. aus d. Verhandl. d. IV. Deutschen Dermatol. Cong.

hood karyokinetic forms could be seen. A very small number of pus-corpuscles could be seen. Neither bacteria nor fungi were found. [These cases are probably of parasitic origin, but clinically and histologically they are simply a folliculitis.]

Eczema caused by the Gases of Cesspools.—DuCastel¹ reports the case of a man who developed eczema after working in a cesspool, and suggests that the eczema may have been the result of the elimination of toxic gases by way of the skin.

Eczema developing in the Areas of Certain Nerves.—Brocq² reports the case of a woman who was suffering from an eczema of both hands symmetrically developed in the areas supplied by the median and radial nerves, that of the ulnar nerve being intact. The patient was neither hysterical nor neurasthenic. In the affected regions there was diminished sensation to touch and pain. The track of the median nerve was tender to pressure. Dejerine, who examined the case, concluded that there was present a neuritis with no involvement of the cerebro-spinal axis.

[This case is another link in the chain of evidence that has recently been accumulating to prove that in quite a number of dermatoses, besides leprosy, there may be disturbances of pain, touch, or even of the temperature sense.]

The Dermatitis of Unna.—Audry³ prefers the title given instead of the ordinary one of seborrheal eczema, for the affection thus designated is neither an eczema nor a seborrhea. The disease must be differentiated from those erythemas that complicate steatosis, as, for instance, about the alæ of the nose. The malady may present itself as faint red spots, and, since it commonly attacks regions already affected with steatosis, the signs of this affection, such as greasy scales or branny flakes, are usually observed. At times these spots may very much resemble the lesions of psoriasis. The favorite sites of this form of the affection are the head and breast. The dermatosis may also occur as plaques. In this form there is a raised red border, slightly scaly, surrounding a depressed center often covered with thin greasy scales (*lichen circinatus* of Wilson). Such lesions occur often on the chest, and by running together form serpiginous figures. On the limbs the plaques are likely to take on more the aspect of an ordinary eczema, and there may be oozing. In neither form of the disease is itching an essential symptom, though it is frequently present. The types of the eruption are altered by certain inflammatory complications which give rise to variations that the author classes as (1) erythematovesicular form; (2) impetiginous forms; (3) erythrodermies.

The most evident point in the etiology of the disease is that preexisting seborrhea seems necessary for its production. The particular organism that causes Unna's dermatosis, in the opinion of the author, has not been discovered. He believes the micrococcus of Unna is only a secondary inoculated organism, and not the cause of the malady. Sulphur is the specific for the

¹ Medical Week, July 20, 1894.

² Ibid.

³ Annales de Dermatol. et de Syph., July, 1894.

dermatosis of Unna. In ordinary cases the author uses a simple sulphur ointment. In addition it is advised to bathe the parts every other day with a mercuric-chlorid solution. When there is suppuration moist dressings of mercuric chlorid should be applied until the formation of pus has ceased, and then the ointment containing sulphur, and an antiseptic, such as boric acid, used. Sometimes the author uses chrysophanic acid. A valuable paste can be made thus:

R. Lanolin,	40 parts.
Vegetable wax,	40 "
Olive oil,	20 "
Sulphur,	?—M.

The amount of sulphur must vary with the requirements of each case.

The Relation of Eczema to the Mucous Membranes.—Von Sehlen¹ sums up his views as to the relation existing between eczema and certain affections of the mucous membranes as follows: (1) Chronic eczema of the skin may attack the adjoining mucous membranes and produce upon them apparently independent affections. (2) Eczema of the lips, catarrh of the external ear, eczema of the lids, and a certain form of conjunctivitis are to be regarded as special localizations of the eczematous process, and are to be treated accordingly. (3) Certain inflammatory conditions of the anal mucous membranes and of the genitalia in both sexes seem to stand in a close relation to eczema of the skin.

The Management of Eczema.—Morris, in a paper read before the section of Dermatology of the British Medical Association at its meeting in Bristol, 1894, states that the cause of eczema in the majority of cases is the local action of microorganisms. The author propounds and answers certain questions: 1. Are internal remedies required in eczema? As a general rule, the less medicine given the better. Any dyscrasia discovered must be treated on general principles. Arsenic is unreliable, and in inflammatory conditions does harm. 2. What is the influence of diet upon eczema? The only effect that diet exerts on eczema is an indirect one, such as may be produced by intensifying such constitutional conditions as gout or diabetes, or by disordering digestion. 3. What are the principles on which the local treatment should be carried out? The author treats every case as though it were of parasitic origin by commencing with some very mild parasiticide and feeling his way to a stronger one. The best remedies for dry, scaly eczema are sulphur and resorcin. In acute conditions ichthylol is useful. Among other remedies useful in eczema may be mentioned salicylic acid, white precipitate, boric acid, and phenol. 4. How is the tendency to recurrence in those predisposed to be overcome? Change of climate, with rest of mind and body, is often useful. Spas are of benefit, chiefly in very chronic cases, and sulphur waters are best for external use. The internal use of the water of

¹ Monatshefte f. prakt. Derm., Bd. xix., No. 1.

sulphur springs is indicated in gouty or rheumatic conditions, while arsenical or chalybeate waters do good when general tonics are applicable.

EPITHELIOMA.

On the Frequent Occurrence of Epithelioma of the Tongue after Syphilitic Lesions.—Cotterell¹ thinks that epithelioma forms a very frequent sequel to syphilitic affections of the tongue. One of the commonest syphilitic affections is syphilitic leukokeratosis (*psoriasis linguæ* or *leukoplakia lingualis*). If this disease of the epithelium is not promptly treated, it may very easily lead to an epithelioma. Another lesion that may be the starting-point for a malignant growth is gumma of the tongue. This lesion often very closely simulates epithelioma, and sometimes the therapeutic test is necessary for differentiation. In the treatment of leukokeratosis the author recommends potassium iodid in full doses, but attaches more importance to the administration of mercury; the latter drug is best given by intramuscular injection or by inunction. Locally the patches should be painted with a solution of chromic acid, and smoking must be prohibited, while all irritants in the mouth must be removed. In operating for epithelioma of the tongue the submaxillary glands should be removed, as thus the likelihood of recurrence is thereby lessened and the annoying dribbling of saliva is prevented.

Paget's Disease of the Nose.—At the recent congress at Rome Dr. A. Ravogli reported a case of Paget's disease of the nose. The patient was an elderly woman who presented an ulcer which involved the whole nose and the inner canthus of the right eye. The affected surface was made up of nodules covered with a whitish macerated epidermis with very scanty secretion. Sections of this growth under the microscope showed nothing characteristic, but scrapings from the surface contained large, double-contoured cells which were thought to be coccidia. From this case the following conclusions were drawn: 1. Paget's disease is not limited to the breasts of women. 2. The factor of importance in the etiology of this disease is a coccidium. 3. The growth is not an epithelioma, but may in time develop into an epithelioma.

[By most authors Paget's disease has been classed as a form of epithelioma.]

Epithelioma developing upon an Eczematous Base.—Wolf² reports the case of a man seventy-five years of age who, for as long a time as he could remember, had had an itching erythematous disease of the hands which had resulted in great thickening of the skin, with fissures and deformity of the nails. Five years ago there had begun on the web between the thumb and index finger of the right hand a small papule, which had soon become transformed into a vesicle that ruptured, with the formation of a crust. Under this was a shallow ulcer which healed under domestic remedies, but broke down again. At the time of the examination there existed an elevated

¹ Medical Week, June 8, 1894.

² The Virginia Med. Monthly, Dec., 1894.

lesion the size of a dollar, the borders of cartilaginous hardness and of a semitranslucent appearance. To the right of the center of the lesion there was a punched-out-appearing ulcer, deep and with the edges undermined. There was no lymphatic involvement. The author thinks that this was a case of superficial epithelioma developing from the chronic irritation of an eczema.

[It is unfortunate that no microscopic examination seems to have been made in this case. There is nothing in the report to show that the disease was not some trophoneurotic affection with chronic ulceration, such as may occur under such circumstances.]

Adenocarcinoma of the Skin originating in the Coil-glands.—Fordyce¹ calls attention to the rarity with which it has been possible absolutely to trace epitheliomata of the skin to the coil-glands as their point of origin. In certain pearly tumors which have been removed from the faces of elderly persons it has been found that the epithelium had undergone a hyaline degeneration. This degeneration accounts for the absence of malignancy often noted in these cases. These pearly tumors have many points of resemblance to the affection known as benign cystic epithelioma. This affection was at first supposed to originate from the sweat-glands, but it has been proved that its point of departure is the epidermis. The author reports the microscopic examination of a tumor that had been removed from the leg of a man thirty-five years old. The growth was distinctly lobulated. Under a low power the derma was found to be occupied by bands, masses, and gland-like arrangements of small epithelial cells. In some parts with a higher power a basement membrane could be made out lined with a layer of columnar epithelium enclosing a distinct lumen. The author thinks there can be no doubt that this epithelioma began in the sweat-glands.

Parasites in Paget's Disease of the Nipple.—Banti² found in a case of Paget's disease bodies in the cells like those described in carcinoma by Ruffer. He regards as ordinary cell-inclusions the bodies described by Wickham as psorosperms.

Epithelioma of the Eyelid cured by Pyoktanin.—Dujardin³ reports the cure of an epithelioma of the eyelid by applications of a solution of pyoktanin, 1:20. The applications were made every other day for several weeks without result; then on the day following an application the epithelioma became suddenly surrounded by an erysipelatous redness, while the ulceration rapidly extended. The pyoktanin was discontinued and starch poultices used. The inflammation gradually subsided and a firm, healthy cicatrix resulted.

LICHEN.

The Present Position of the Lichen-question.—At the International Congress in Rome two dermatologists expressed⁴ their views on what is

¹ Jour. Cutan. and Genito-urin. Dis., Feb., 1895.

² La Sperimentale, March, 1894.

³ Jour. des Sci. méd. de Lille, June 16, 1894.

⁴ Separat-Abdruck aus dem Archiv für Dermatol. u. Syph., 1894.

meant by the term "lichen." Morris believes that (1) lichen is not a disease, but a type of lesion; (2) the term should be reserved for the clinical entity described by Wilson under the name lichen planus, which is the same as Hebra's lichen ruber; (3) the affection described by Kaposi under the name of lichen ruber acuminatus is the same as that called by Devergie pityriasis ruber pilaris; (4) other forms of lichen, obtusus, verrucosus, etc., are varieties of lichen planus; (5) the group of symptoms to which the term lichen planus is applied is probably caused by a variety of factors of which we are at present ignorant. Neisser believes that (1) lichen ruber appears in two forms, the lichen planus of Wilson and lichen ruber acuminatus; (2) pityriasis ruber pilaris of Devergie is a disease *sui generis*.

In a clinical lecture Neumann¹ thus sums up his views about this matter: 1. The divisions of lichen proposed by Willan cannot now be recognized, as lichen agrius is papular eczema, lichen lividus is purpura papulosa, lichen pilaris is hyperkeratosis, and lichen urticatus is urticaria papulosa. 2. Lichen scrofulosorum is a true lichen. It appears in the scrofulous subject early in life, and is generally accompanied by tuberculous infiltration of the lung. 3. The lichen ruber of Hebra is a lichen. 4. Lichen planus may appear in combination with lichen ruber, but is more commonly separate, forming another of the lichen group. 5. Pityriasis ruber pilaris has only a few conditions in common with lichen ruber, and is distinguished by the character of the nodules, the course of the disease, and the pathologic changes as seen by the microscope.

Lichen Ruber Acuminatus and Lichen Ruber Planus.—Kaposi,² for many years, has endeavored to impress upon the dermatologic world the identity of his lichen ruber acuminatus with the lichen ruber of Hebra, and of his lichen ruber planus with the lichen planus of Wilson. This identity is now generally accepted, but the French have differentiated a disease which they describe under the name pityriasis rubra pilaris (Besnier), which is causing no little trouble among nosologists. Kaposi has, since the Dermatologic Congress in Paris, 1889, contended that this disease presents no essential differences from his lichen ruber acuminatus; in fact, he regards them as one and the same disease. From an exhaustive study of the reported cases of pityriasis rubra pilaris (Besnier) he finds that the two arguments of the French—namely, (1) the different course, (2) the different manner in which it acts toward medicaments—can no longer be sustained. Specialists have been firm in adhering to the fact that lichen ruber planus may present great variation in its clinical picture, and still be lichen ruber planus; so Kaposi cannot see why lichen ruber acuminatus should not be likewise regarded. Certain it is that it can present a variable symptomatology and clinical aspect. In general it is a severer disease than the planus form, but not every case leads in from one to three or five years to marasmus and death, and not every case reacts to arsenic. This is exactly the condition

¹ Med. Press and Circular, Sept. 19, 1894.

² Arch. f. Dermatol. u. Syph., Band xxxi. Heft 1.

found in pityriasis rubra pilaris (Besnier). We are in the same position as regards psoriasis, pemphigus, and prurigo, in which the clinical aspect and the symptom-complex vary greatly, yet despite these variations we are able to adhere to the fundamental type and diagnosticate the true disease.

LEPROSY.

Leprosy in North America.—Hyde¹ gives this summary of the distribution of cases of leprosy which have thus far been recognized in the United States: Arkansas 3, California 158, Dakota 2, Florida 6, Georgia 1, Idaho 2, Illinois 13, Indiana 2, Iowa 20, Louisiana 83, Maryland 4, Massachusetts 5, Minnesota 120, Missouri 2, Mississippi 2, New York 100, New Jersey 1, Oregon 3, Pennsylvania 6, Utah 3, Wisconsin 20; total, 560.

White² argues that leprosy is contagious, basing his opinion upon the following points: 1. The history of the action of the disease upon communities or nations; 2. Its action upon individuals; 3. Its resemblance to other affections generally regarded as contagious; 4. The demonstration of a satisfactory cause of contagion; 5. The influence of control upon its history and course. Dr. White thinks it is of the highest importance to establish in the United States the following laws for the control of leprosy: 1. Every physician should be required to report to the nearest Board of Health the existence of a case of leprosy; 2. Immigrants affected should be invariably sent back to their previous homes; 3. Graded hospitals should be established by the government in which suspects and confirmed cases can be isolated.

The Lepers of Iceland.—Ehlers,³ influenced by Zambaco's statement that scleroderma, sclerodactylia, ainhum, morphea, and some of the gangrenous affections of the extremities are all modified forms of leprosy, undertook a study of leprosy in Iceland, where, if anywhere, the disease has been left to work out its own destiny uninfluenced by importation or civilization. Leprosy has been known in Iceland since the thirteenth century. Ehlers found that while in some parts of the country the disease is on the decrease, and has even disappeared, in others it has of late years been making alarming strides. He found that there are at present in the island 141 cases. The hygienic and social conditions are very favorable to the spread of the malady, as the people live in an exceedingly filthy manner, nor is there any effort at isolating lepers. The duty of keeping statistics is entrusted to the priests, who practise homeopathy, knowing nothing of medicine. The author was not able to find any proof of Zambaco's opinion, with the exception of a case which he believes would in Europe have been considered as an example of Morvan's disease, but which was certainly a case of leprosy. From his observations Ehlers concludes that leprosy is certainly a contagious disease, but he has found no evidence that it is hereditary.

¹ Am. Jour. Med. Sci., Sept., 1894.

² Boston Med. and Surg. Jour., Oct. 25, 1894.

³ Medical Week, Nov. 30, 1894.

The Nature and Treatment of Leprosy.—Bibb¹ in his Alvarenga prize-essay reaches the following conclusions as to the nature and treatment of leprosy: 1. Leprosy is a specific disease due to the presence of the lepra-bacilli; 2. Leprosy is influenced by race, soil, climate, food, etc. only in so far as these environments tend to enervation on the one hand or to physical well-being on the other; 3. Experiments have not demonstrated leprosy to be inoculable on man or beast; 4. It is hereditary; 5. It is contagious, infectious, and communicable under conditions not yet understood; 6. It is both mitigable and curable; 7. Chaulmoogra oil is a drug of unquestionable value in the treatment; 8. It may be completely eradicated from the list of human diseases.

[The last conclusion of the author is the most important from a practical point of view. When we consider the comparatively small number of those affected in countries in which the disease has been endemic for ages, we are forced to the conclusion that the contagiousness of the disease, though undoubted, must be very slight. One of the most surprising things in connection with leprosy is that its suppression occupies so large a share of both the public and professional attention, while this aspect of the far more important subject of tuberculosis has been comparatively neglected.]

Early Bacteriologic Diagnosis of Leprosy.—Marcano and Wurtz² from their studies conclude that leprosy often first manifests itself as a non-characteristic macule. The demonstration of lepra-bacilli in these spots is of the highest importance. The lesion should be excised, taking tissue beyond the anesthetic zone, and search for the bacilli must be made in the entire thickness of the derma.

A Wound followed by Leprosy.—Ashmead³ records the case of a man that had lived for many years in leprosy countries, who while dressing a fish received a wound of the thumb from the fin of the fish. Swelling of the arm followed, and soon after bullæ upon the chest, the head, and face. In a few months the blotches left from this eruption became leprosy tubercles, and other well-marked signs of the malady followed. The author asks if in this case we have to do with a latent leprosy which was evoked by the wound, or if this is a case of inoculation from the fish.

The Bacillus in Nervous Leprosy.—Petrini⁴ does not think that the usual point of differential diagnosis between leprosy and syringomyelia, the dissociation of sensation and the presence of nodes on the nerves, can be implicitly relied upon, since the dissociation may occur in leprosy and nodes may be found on the nerves in syringomyelia. The only positive way of making the diagnosis in leprosy is by demonstrating the bacilli. Even when the disease is as much confined to the nervous system as we ever find it (for the perfectly pure type of nervous leprosy is extremely rare), it is possible,

¹ Am. Jour. Med. Sci., Nov., 1894.

² Arch. de Méd. exper. et d'Anat. path., Jan., 1895; Univ. Med. Mag., April, 1895.

³ Jour. of Am. Med. Assoc., March 16, 1895.

⁴ Annales de Dermatol. et de Syph., Dec., 1894.

for instance, to find the bacilli in the blood withdrawn from the finger. The bacilli are very few, and it requires much patience to find them in this way. The bacilli can also usually be shown in the serous or purulent contents of bullæ caused by the application of vesicatories, but here also there are but few bacilli, and they are often broken up and hard to recognize. Contrary to what has usually been taught, the author thinks that in the anæsthetic areas of the skin, even where no lepromes exist, the bacilli are always to be found, and usually in considerable numbers. Thin sections of the skin are to be made. The organisms are most abundant in the lower layers of the dermis.

[It has happened to us recently to see a well-defined case of leprosy of the mixed type in which there were areas of the body where dissociation of sensation was well marked.]

Toxicity of the Urine of Tuberculous Lepers.—Chatinière¹ has in three instances tried the effect of injections of the urine of persons affected with tuberculous leprosy into rabbits. In each experiment the animal could stand a much larger dose of the urine than would have been the case had the urine been that of a normal person. From these experiments he concludes that the urine of lepers is less toxic than normal urine.

A Quick and Easy Method for the Bacteriologic Diagnosis of Leprosy.—Tschernogubow² gives the following rapid method of obtaining the lepra-bacillus for examination: Secure a spear-shaped inoculation-needle and several capillary glass-tubes with an enlargement in the middle and sealed ends, such as are used for collecting vaccine-lymph, and also a spirit lamp or any convenient flame. Prepare the site of operation as for any other operation, the instruments used to be sterilized. Insert the needle into and through a lepra-tubercle or infiltration; now break one end of the sealed capillary tube and heat in a flame; insert the tube into the wound, bringing the lips of the wound in close contact with the tube. As the tube cools a mixture of blood and lymph flows in. When the tube is filled, immediately seal the broken end. When one wishes to examine the contents, break both ends off and blow the contents upon a cover-glass or slide, fix, and stain. By this method plenty of bacilli are secured, which can be kept an indefinite length of time in the sealed tubes.

LUPUS ERYTHEMATOSUS.

Lupus Erythematosus with Suppurating Cervical Glands, with Tubercle-bacilli in the Pus.—Leredde³ reports the case of a woman sixty-seven years old who had had lupus erythematosus of the face for seven or eight years, associated with suppuration of the cervical lymphatic glands. Pus drawn from the glands was found to contain tubercle-bacilli in great numbers. [It cannot be too much insisted upon that at present the term lupus erythematosus is merely a clinical name. Since we do not know the essential nature of the disease, it may be that it has a different etiology in different cases.]

¹ Annales de Dermatol. et de Syph., March, 1895.

² Arch. f. Derm. u. Syph., Bd. xxxi. Heft 2.

³ Medical Week, Jan. 22, 1894.

Lupus Erythematosus and Tuberculosis.—Brooke¹ does not believe that all cases of lupus erythematosus are due to the tubercle-bacillus, but he thinks that in some cases this organism may act as an exciting cause. He narrates this case as an illustration: The patient was a married woman thirty-three years old. Her skin trouble began on her face during her last pregnancy. At the time when she was first seen the lesions were typical of lupus erythematosus. They covered the nose and upper lip, extending to the cheeks on both sides, and, passing up over the nose, they covered the forehead and the entire scalp. The whole front half of the head was denuded of hair, and behind the hair was thin. There were patches of disease on both eyelids. Both ears were affected and the nape of the neck. From this point the disease spread on to the back and the shoulders, and downward over the whole of the chest as far as the nipples and the lower part of the sternum. The chest from the neck to the nipples was covered with a network of circinate lesions, each consisting of an outer erythematous border, surrounding a raised gray edge dotted over with comedo-like plugs, and inside of this an atrophic center. Other portions of the body were free. Soothing applications were ordered, which gave comfort. After a time, as the general condition of the patient was deteriorating, an examination showed that she had fever and a catarrhal condition of the lungs. The eruption began to extend to the abdomen and arms, but the new rash was papular and did not resemble the old one. The mouth became filled with minute excoriations. A diarrhea typhoidal in character set in, the lung-signs became more marked, and the patient died. The necropsy showed bronchopneumonia and tuberculosis of the intestines. The author thinks that the coincidence of the tuberculosis and the lupus was more than accidental.

[From time to time literature has contained reports of cases more or less similar to the one just cited. We have seen and reported such cases. The malady runs an acute course, and the patients die of septic poisoning strongly suggestive of acute tuberculosis.]

LUPUS VULGARIS.

Lupus Vulgaris.—Gottheil² calls attention to the widespread notion that when the tubercles of lupus are mentioned nodules more or less elevated above the level of the skin are intended. As a matter of fact, the semitransparent, brownish nodules are often depressed. The author tabulates the following points as of importance in the diagnosis of lupus: 1. The disease begins in youth; 2. Its course is extremely chronic; 3. The characteristic tubercles are present; 4. Ulcers are crescentic in shape, with soft margins and floors, covered with abundant granulations; 5. Lupus is most common on the nose and face; 6. It destroys cartilage, but not bone; 7. New tubercles appear from time to time in the apparently healthy scar.

Tuberculous Lymphangitis.—Cahill³ records a case of lymphangitis

¹ British Jour. Dermatol., March, 1895.

² Internat. Med. Mag., Oct., 1894.

³ British Jour. Dermatol., Jan., 1895.



Mr. Cabill's case of tubercular lymphangitis.
British Journal of Dermatology, January, 1896.



of tuberculous origin that occurred in a woman fifty-two years old. There was no family history of any tuberculous trouble. Twelve years before she came under observation she had noticed upon the heel of the left foot a rough, tender spot as large as a sixpence which she described as a corn. For fully five years it remained quiescent, causing no trouble except soreness when rubbed by her shoe. At the end of this period there began to form, first at the site of the corn, fleshy nodular masses that gradually extended up the back of the foot and then to the instep. Two years after the disease had begun to extend on the foot a swelling was noticed over the metacarpophalangeal joint of the right fore finger; ulceration followed, which extended over the back of the hand and wrist, while the finger became stiff and useless. At the time of the examination the foot and ankle were stiff and swollen from a brawny edema. The lesions of the skin consisted of irregular nodular masses of a deep-red color and firm consistence, which were grouped into patches. These patches were found on the dorsum of the foot, along the front of the leg as high as the knee, and up the back of the leg. On the heel and instep there were ulcers which exuded an ichorous discharge. On the right hand there were two sinuses on the back and two on the palmar surface, leading down to the metacarpophalangeal joint of the right index finger. The skin of this finger was much thickened and ulcerated in places. There were several indolent ulcers on the back of the hand and wrist. Two inches above the elbow on the inner side of the left arm was a hard subcutaneous mass as large as a walnut, freely movable under the skin. All other portions of the body were healthy. A microscopic examination of one of the nodules showed it to be made up of a small-celled infiltration with giant-cells, but no tubercle-bacilli could be demonstrated. The author does not consider that this latter fact throws doubt on the diagnosis, as it is well known that Koch's bacillus is often not found in lupoid tissue of old formation. Pringle, who adds some notes to the clinical description of the case, thinks that the wart from which the malady arose was a verrucose tuberculosis.

[In any chronic obstruction of the lymphatics it is common to have an elephantiasis condition, and this seems to have been present in this case. Another evidence of lymphatic involvement is to be able to withdraw from the nodules or varices lymphatic fluid. It is to be regretted that no mention of such a phenomenon is made in this case.]

A Discussion on Lupus.—Leloir¹ in a discussion on lupus divides the tuberculous affections of the skin into the following groups: *A.* True lupus, exedens and nonexedens. *B.* Atypical varieties of lupus: (1) *Lupus vulgaris colloide*. (2) *Lupus vulgaris myxomatosus*. (3) *Lupus vulgaris seletrosus*. (4) *Lupus vulgaris erythematoid*. *C.* Scrofulotuberculous gummata, dermic and hypodermic. *D.* Ulcerative tuberculosis. *E.* Mixed tegumentary tuberculosis resulting from a combination of two or more of the above forms. From a clinical point of view lupus is distinguished from other forms of cutaneous tuberculosis by the special form of its lesions, by its

¹ Brit. Med. Jour., Sept. 8, 1891.

chronicity, extensive course, appearance in early childhood, its rarity in certain territories frequently invaded by true tuberculosis, and the good state of the patient's general health. There are atypical forms of lupus that more or less closely resemble other forms of cutaneous tuberculosis.

Lupus Telangiectodes Disseminatus.—Under this title Majocchi¹ describes a form of lupus vulgaris in which the first clinical signs are small capillaries arranged in tufts and rays. Later, part of these vessels shrink, but in other portions they become immensely dilated, falling into a varicose condition. The most successful treatment has been by means of destruction with the galvanocautery.

THE THERAPEUTICS OF CUTANEOUS DISEASES.

Arsenic in Skin-diseases.—Dyer,² in an article upon the use and abuse of arsenic in skin-diseases, thus sums up his views: We must arrive at the conclusion that, instead of being the first, arsenic should be one of the last remedial agents to be used in the treatment of diseases of the skin, and when selected it should only be used in chronic diseases with a general distribution and in diseases associated with a neurotic element.

Rest in the Treatment of Skin-diseases.—Harrison,³ in his address before the section of Dermatology of the British Medical Association, draws attention to the importance of rest in the treatment of severe skin-diseases. This is of special importance in eczema and psoriasis, and often, if the patient is put to bed for a time, it will be found that remedies that had before failed will have a beneficial effect.

Adeps Lanæ in Practice.—Unna⁴ thinks that adeps lanæ is to be preferred to lanolin, both on account of its superiority and because it is cheaper. He gives this formula for cold cream:

R. Adeps lanæ,	10.0;
Olei amygdalarum,	10.0;
Aquæ naphthæ,	20.0.

Treatment of the Night-sweats of Pulmonary Tuberculosis.—Szekely⁵ recommends that in the night-sweats of pulmonary tuberculosis the whole body be washed on going to bed with this mixture:

R. Hydrate of chloral,	ʒjss;
Water,	
Alcohol,	āā. ʒiiijss.

A mixture formed by adding a teaspoonful of cayenne pepper to a glass of vinegar has also proved of advantage. These methods are preferable to the use of dusting powders, which are apt to cause cough.

¹ Berlin. klin. Woch., No. 20, 1894.

² Med. News, Sept. 1, 1894.

³ Brit. Med. Jour., Aug. 4, 1894.

⁴ Monatsheft f. prakt. Derm., Bd. xx., No. 1.

⁵ Medical Week, Sept. 17, 1894.

The Treatment of Trichomycosis in the Last Stage.—Wickham¹ thinks that it is very important, on account of the bad moral effect of keeping children for a long time away from school, to cure up the last remnants of trichomycosis as soon as possible. When groups of four or five diseased hairs are left, he believes that the destruction of the hairs by electrolysis is the best treatment.

Treatment of Favus.—Zinsser² has found heat to be a valuable remedy in the treatment of favus of the head. The cases are treated in the following manner: All crusts are removed and the hair is shaved. The head is covered with a compress steeped in a 3 per cent. solution of phenol. On top of this a metallic Leiter's coil, shaped to fit the head, is applied, through which a continuous stream of water at a temperature of from 52° to 55° C. is passed. This apparatus is kept on all day, and the treatment should be continued for eight or nine days. Three out of four cases were cured in this way.

Tsitrine³ calls attention to a formula introduced by Pirogoff⁴ for the treatment of favus, that has been forgotten:

R. Sublimed sulphur,	℥ss ;
Potassium carbonate,	℥j ;
Distilled tar,	℥iiss ;
Tincture of iodine,	℥iiss ;
Lard,	℥iij.—M.

After shaving the head a compress smeared with this ointment is applied and allowed to remain twenty-four hours. The softened scabs are removed with a spatula, the head is washed with soap, and a fresh compress of the ointment is put on. These applications are repeated every twenty-four hours until active desquamation is established, after which the inflammation is allayed with a paste composed of zinc oxid, starch, and salicylic acid.

Treatment of Tinea Tonsurans.—Brocq⁴ writes of some methods of treating tinea tonsurans introduced by Sabouraud. In the trichophytosis of animal origin it is frequently necessary to begin with soothing treatment on account of the inflammatory symptoms often present. For this purpose dressings of boric gauze may be used. After the inflammation is subdued, vaselin containing iodine in increasing strengths from 1 up to 20 per cent. is applied. Still more may be accomplished by painting the diseased areas, which have been washed and surrounded with an area from which the hair is epilated, with tincture of iodine, and then applying over this a layer of Vigo plaster. These applications may be made every day or every second day according to the amount of reaction caused. In the form of the disease depending upon the presence of the microsporon Audouini, Sabouraud thinks the following method is the best: Each night the diseased area is entirely covered with a cotton tampon wet in this solution:

¹ Medical Week, June 22, 1894.

² Arch. f. Dermatol. u. Syph., Bd. xxix. Heft 1.

³ Medical Week, Dec. 7, 1894.

⁴ Jour. Cutan. and Genito-urin. Dis., Oct., 1894.

R. Calcium chlorid,	ʒiiss ;
Water,	ʒx.—M.

Cover with a piece of rubber tissue. The next morning wash with soap and cover with diachylon plaster. Twice a week apply tincture of iodin to all the diseased spots.

The Best Form of Glycerol-jelly.—According to the experiments of Hodara,¹ the best formula for a soft glycerol-jelly is—

R. Water,	55.0 parts.
Gelatin,	12.5 “
Glycerol,	12.5 “
Zinc oxid,	20.0 “

If a hard very contractile jelly is wanted, this formula is used :

R. Water,	50.0 parts.
Gelatin,	15.0 “
Glycerol,	10.0 “
Zinc oxid,	25.0 “

Thyroid-feeding in Diseases of the Skin.—Jackson,² after narrating his experience with thyroid-feeding in skin-diseases, which was not very encouraging, sums up his conclusions as follows: “Personally, I am not inclined to experiment further with this line of treatment, when you consider that the drug, in whatever way you exhibit it, is liable to produce sudden distressing and grave symptoms that bar it from use in out-patient practice. In myxedema and cretinism it is worth while to run a risk as to life in the hope of removing symptoms that make life hardly worth living. In dermatoses, on the contrary, life is generally little endangered, and we are not justified in resorting to too heroic measures.”

Abraham thus sums³ up his views as to the use of the thyroid gland in the treatment of skin-diseases: (1) The ingestion of thyroid gland, although of specific value in myxedema and sporadic cretinism, has no constant effect in psoriasis and in many other diseases of the skin; (2) In a large number of cases the results are negative, and in a few the cutaneous lesions are aggravated; (3) In a certain number there is a distinct and marked curative effect; (4) At the present time we have no prior indications as to which cases will be benefited; (5) In a considerable number of cases disagreeable constitutional effects are induced; (6) Age and sex have nothing to do with the success of the remedy.

Treatment of Pityriasis Capitis.—Unna⁴ advises for the treatment of pityriasis capitis washing of the head twice a week with potash soap. The following pomade is then rubbed in:

¹ Monatshefte für prakt. Dermatologie, March 1, 1894.

² Jour. Cutan. and Genito-urin. Dis., Oct., 1894.

³ The Provincial Med. Jour., Dec. 1, 1894. ⁴ Rev. de Théor. méd.-chir., June, 1894.

R. Precipitated sulphur,	from 1 to 3 parts.
Simple ointment,	30 parts.

If there is much falling off of the hair, it is well to add to this from 2 to 10 per cent. tincture of cantharides. This treatment acts as a prophylactic against seborrhæic eczema of the rest of the body.

Iosophan in Dermatology.—Cantrell¹ has used iosophan, and comes to the following conclusions regarding it: (1) It is entirely inefficacious in almost every disease of the skin; (2) tinea sycosis was cured in one instance, but after two months' treatment; (3) it may perhaps be beneficial in acne; (4) it is a waste of time for any one to make use of it in treating diseases of the skin.

The Treatment of Sycosis.—Boisseau du Rocher² records the case of a man suffering from sycosis of the face and neck upon whom various pomades, pigments, cataplasms, and finally the electro-cautery, had been used without avail for a period of a year. The author determined to make use of a method of electrolysis with which he has often had success. Needles of pure silver were thrust into the affected tissues, and these were connected with the positive pole of a galvanic battery, while a moist electrode connected with the negative pole was placed on a neighboring part of the body. In the passage of the current through the silver the liquids of the body are decomposed, with the formation especially of the sodium chlorid, and the silver forms the oxychlorid. A strong current is not necessary, one of from 3 to 4 ma. being sufficient. In the case under consideration 10 or 12 needles were implanted at once and the current passed for ten minutes, the sittings being given twice a week. In all, 25 sittings were necessary to effect a cure.

Compound Tincture of Coal-tar.—According to Dühring and Baer,³ a good substitute for such preparations as liquor carbonis detergens may be made in the following way: A strong tincture of quillaia bark is made by adding 1 part of the bark to 4 of 95 per cent. alcohol. One part of coal tar is digested with 6 parts of this tincture, with frequent agitation, for not less than eight days. With water this forms a clean, yellow emulsion. It should be generally used in the strength of 1 part to 60 of water.

A New Treatment of Guinea-worm.—Emily,⁴ instead of using the old method of treating Guinea-worm by gradual traction, recommends the following procedure: When the worm lies under the unbroken skin a syringe-ful of a solution of mercuric bichlorid is injected into the body of the worm at several points. In a little while the poisoned worm is absorbed, and there is no further trouble. When the worm has formed an opening through the skin, the part protruding is injected with the solution and also the portion of the body still under the skin. In a few days the dead worm can be easily removed.

¹ Therap. Gaz., April 15, 1895.

² Jour. de Méd. de Paris, March 31, 1895.

³ Am. Jour. Med. Sci., May, 1894.

⁴ Archives de Médecine navale, June, 1894; Brit. Med. Jour., July 7, 1894.

Abortive Treatment of Furunculosis.—Brocq¹ states that, according to Loewenberg, boils can be aborted by the application of the actual cautery. The cautery iron ends in a fine platinum point. When a boil is just commencing the cautery is introduced at the center of the red area, trying to make it follow the course of the affected hair-follicle. The cautery-point should be at a white heat and should be kept in for an instant. When a furuncle is further developed it may still be aborted, but the point must be kept in longer, so as to completely carbonize the drop of pus which has already formed.

Van Hoorn,² believing that infection in furuncle takes place from the outside, recommends the following treatment as being very successful: The entire skin is cleansed by a warm bath with soft soap. The furuncle and the surrounding skin are washed with a 1:1000 solution of mercuric chlorid. The boil is then covered with phenol and mercury plaster-mull, and the patient puts on clean linen. Twice a day new plasters are applied, and if the furuncle has opened the pus is gently squeezed out and the entire region carefully disinfected with the mercuric solution.

Neuberger³ thinks that boils can often be aborted in the early stages by the application of Unna's mercury-phenol plaster-mull. As this is apt to cause a dermatitis, he prefers salicylated soap plaster of 5 to 10 per cent. strength. When fluctuation is present before the remedy can be used, a small incision should be made and the plaster applied, with a piece of absorbent cotton at its lower edge to catch the discharge.

Pilocarpin in the Treatment of Urticaria.—Abrahams⁴ draws attention to the value of pilocarpin in the treatment of urticaria. The failure to obtain good results is either from the fact that an eczema has been caused by the scratching or the diagnosis was incorrect or a bad sample of the drug was used. In giving the drug to adults, from one-sixth to one-half gr. should be administered hypodermically every day or every other day; for a child one year old from one-twentieth to one-eighth gr. in water at bedtime. By feeling one's way to the administration of a large dose, no danger need be apprehended. For the drug to do any good, it seems that it is necessary for it to produce free sweating, and this should be the index of the amount to be given.

The Treatment of Leukoplakia.—Leistikow⁵ uses this paste in the treatment of leukoplakia:

R. Terræ siliciæ,	3iiss;
Resorcin,	3iij;
Adipis,	3ss.

¹ Jour. Cutan. and Genito-urin. Dis., Oct., 1894.

² Monats. f. prakt. Derm., Bd. xix., No. 1.

³ Derm. Zeitsch., i. 387, 1894; Am. Med.-Surg. Bull., Feb. 1, 1894.

⁴ Med. Rec., Sept. 15, 1894; Therap. Gaz., Dec. 15, 1894.

⁵ Monatshft. f. prakt. Derm., xix. p. 371.

This is to be applied with a piece of wood many times a day, especially after meals and on going to bed. After a time the use of the paste becomes painful, when it is to be stopped and the mouth washed frequently with borax-peppermint water, and balsam of Peru applied to the patch.

Treatment of Acne Rosacea.—Purdon,¹ in speaking of the treatment of acne rosacea, quotes the following from a letter of Unna's: "I have never recommended ichthyol in acne, but only in rosacea, which is never a sequence of real acne, but of seborrhoeic eczema, the tubercles of which are none of acne, but of a special folliculitis. This common mistake explains perhaps the usual use of ichthyol by other dermatologists in acne."

Treatment of Small-pox.—Moir² gives some account of the treatment of small-pox by the exclusion of the chemic rays, as practised by Finsen and others. This method consists in hanging before all the orifices in the sick-chamber through which daylight can enter curtains of red and yellow cloth. This treatment is founded on the assumption that since the chemic rays are capable of exciting dermatitis, they can aggravate the inflamed condition of the skin in small-pox. It is pointed out that the pitting is usually most marked on those parts exposed to the light, as the hands and face. Moir states that he has always found an abundance of light and air the best for small-pox patients. He calls attention to the well-known fact that sunlight is one of Nature's greatest germicides, as it has been shown that sunbeams are able to destroy bacteria at a depth of twenty inches below the surface of water.

Finsen³ contributes a long article setting forth the advantages of the method of treating small-pox by the exclusion of the chemic rays of light. The author quotes Lindholm and Swendsen, who treated in this way 8 cases, and found that the stage of suppuration did not occur at all, the patients becoming convalescent immediately after the stage of vesiculation; there was no disfiguring pitting. Others are quoted as expressing similar views. The author insists that to be efficacious the exclusion of the light, save what is admitted through thick red shades, must be absolute. This treatment does not claim to prevent death from small-pox, but very materially to diminish the amount of pitting.

[The scientific world seems now to be agreed that small-pox is a disease due to a bacterium. Most parasites of this class seem to be injuriously affected by direct sunlight. The peculiarities of the small-pox organism have not yet been sufficiently investigated to determine its reaction to light. It would be very interesting were it to be shown that it is really a light-lover.]

Lichen Infantile, and its Treatment.—Under this title Escherich⁴ describes a dermatosis frequent in anemic children characterized by an eruption of small yellow or brown nodules situated principally on the extremities and accompanied by much itching. In the treatment of this affection the author

¹ Dublin Jour. Med. Sci., May, 1894.

³ Medical Week, Oct. 5, 1894.

² Lancet, Sept. 29, 1894.

⁴ Medical Week, Sept. 7, 1894.

makes use of equal parts of olive oil and green soap rubbed in at night and allowed to remain over night. In the morning a bran bath is given. The parts are kept dusted with starch during the day. Internally cod-liver oil is given.

Treatment of Sycosis Menti.—McElligott¹ treats sycosis of the beard, both parasitic and nonparasitic, in the following way: The beard is cropped as close as possible. The affected area is washed with superfatted soap and warm water. Lint soaked in vinegar (the acetum of the B. P.) is applied, and over it oiled silk. After twelve hours this is removed, and lint soaked with mercuric-chlorid solution 1:1000 is substituted and allowed to remain for a similar period. This dressing is repeated every day for four days. Then the frequency is reduced to once or twice a week. A cure is usually effected in three weeks.

The Etiology and Treatment of Acne Vulgaris.—Mackenzie,² in a paper read before the section of Dermatology of the British Medical Association, expresses the opinion that acne vulgaris is a local malady very little affected by constitutional conditions. The essential cause is obstruction of the sebaceous ducts induced by perversion of the normal development of the hair- and gland-structures, especially apt to occur about the time of puberty. Dust and dirt act as intensifying causes. Suppuration is due to the entrance of pus-cocci into the mouths of the follicles. In local treatment three things are to be kept in mind: (1) To remove the superfluous sebaceous secretion and to exert a dermatolytic action on the epidermic accumulations at the mouth of the ducts; (2) To stimulate the sebaceous glands to a healthy activity; (3) To keep the skin aseptic.

The medicated soaps devised by Eichhoff fulfil all these indications. All comedones must be expressed, pustules should be opened, and when there is much inflammation soothing applications should be applied. When the inflammation is slight, sulphur forms a good stimulant. The author has never derived any benefit from the internal use of calcium sulphid.

The Radical Treatment of Lupus.—L. A. Bidwell³ believes that a careful consideration of the pathology of lupus leads to the conclusion that the ideal treatment is a complete and free excision of the diseased skin. Formerly this was possible only in very limited areas, but the method of skin-grafting introduced by Thiersch has rendered it possible to treat in this way patches of almost any size. The author believes that the essential points in the operation are to secure complete antisepsis, and to see that the skin-grafts lap over on the edges of the wound and on each other. The author advises the use of a gauze made of spun glass as a dressing for the wound, as the grafts will not stick to this, while at the same time free escape of secretions is allowed.

Parachlorophenol in the Treatment of Lupus.—Elsenberg⁴ has used parachlorophenol in the treatment of lupus with success. He finds that this

¹ Lancet, Oct. 27, 1894.

² British Med. Jour., Sept. 29, 1894.

³ Lancet, July 21, 1894.

⁴ Arch. f. Derm. u. Syph., Bd. xxviii. Heft 1.

remedy determines cicatrization of the ulcers and destruction of the nodules, and that it prevents the development of new foci better than any other medicament which has been used for this purpose. Two preparations of the drug were used, but their effects were identical. One preparation was the pure crystallized drug melted over a water-bath, and the other a liquid parachlorophenol containing a certain quantity of orthochlorophenol. The remedy was used in the following manner: The patches of lupus were washed with alcohol and then with ether; the diseased areas were then carefully gone over several times with a cotton swab steeped in parachlorophenol. After this the patches were covered with this ointment:

R. Parachlorophenol,	
Lanolin,	
Vaseline,	
Powdered starch,	āā. ʒiiss.

This ointment was allowed to remain for ten or twelve hours, when it was removed with cotton wool, and an iodoform ointment applied instead. The first effect of the application is to cause a paling of the tissues, soon succeeded by an intense redness, and in from twelve to twenty-four hours the formation of a crust. The applications should be made at intervals of two days, and several are necessary to bring about complete cicatrization. The method is painful, but not so much so as pyrogallie acid.

Treatment of Lupus by Thiersch's Grafting.—Lang¹ reports four patients cured of lupus vulgaris by extirpation followed by skin-grafting by Thiersch's method. Since complete extirpation of all the diseased tissue is necessary, the more recent and the smaller the patch of lupus the more successful is the method.

The Commoner Varieties of Lupus Vulgaris, and their Treatment.—Walker² divides the commoner varieties of lupus vulgaris into three forms: 1. The ulcerating form. In this variety, which is most common on the face, the affected area is covered with granulations, giving rise to a purulent discharge which dries up into a crust. The granulations of this form differ from the granulations of an ordinary ulcer in that they are covered by epidermis. The epithelial cells are swollen, degenerating, and allow the passage of serum and leukocytes; thus the process may be called a catarrhal one. This is due to the secondary inoculation of organisms other than the tubercle bacillus. 2. Lupus vulgaris. This is very common, and in it no ulceration occurs. It is a miliary tuberculosis of the skin, and presents multitudes of little tubercle-follicles which constitute the apple-jelly nodules. If a sufficient number of the nodules run together, the epidermis is lost, and the area, becoming inoculated with other organisms, gives rise to the form of the disease just mentioned. 3. Lupus fibrosus. In this form the patch is usually single, and varies in size from a sixpence up to six inches in

¹ Medical Week, Nov. 2, 1894.

² Edinburgh Med. Jour., Aug., 1894.

diameter. The skin is thickened and red and often scaly. No tubercles can be made out on account of the diffuse redness which masks them. A common site for this variety is the buttock.

The author calls attention to the fact that in the treatment of lupus, though our aim is to destroy the tubercle-bacillus, we should never forget that there is a patient back of the disease. Excision, where possible, would theoretically be the best treatment, but, unfortunately, to be effectual the incision must be carried very wide of the diseased areas, and thus much tissue is sacrificed. Scraping with the sharp spoon serves to remove the softer tissues, but it will always leave some tubercle behind in the more fibrous tissue. In the ulcerative forms it is best first to apply some antiseptic, such as Brooke's ointment, then to scrape, and finally to apply such remedies as pyrogallie acid, phenol, and silver nitrate. Where the apple-jelly nodules alone are present, we must make use of such remedies as have a selective action upon the lupus tissue (such as pyrogallie acid). In the third form of the disease it is repeated blistering of the patch which accomplishes most. This presumably acts like the congestion-method of Bier. After most of the diseased tissue has been removed by these methods the author destroys the remaining nodules by the actual or the galvanocautery. In very small nodules electrolysis may with benefit be used for destruction.

Treatment of Lupus by Cantharidin.—Liebreich¹ calls attention to the fact that, after all, the tubercle-bacillus is not the cause of lupus, but only a parasite which develops and causes lesions in a soil already diseased. This peculiar receptivity is called predisposition. Medicaments employed for tuberculosis cannot, therefore, be directed alone to the destruction of the bacillus, but the cause of the sinking of the vital forces must be set aside. All methods and medicaments hitherto employed have been directed alone toward the destruction of the bacillus. In cantharidin the author thinks to have found a remedy that acts by its influence upon the cell-metabolism and by increasing its vitality, thus effecting the primary indication according to his deductions made above. The remedy has been employed by injection and by the mouth in the pure form or in form of sodium cantharidate. For the injection he employed 0.1 cantharidin dissolved in 500 c.c. of tinctura corticis aurantii. The injections were made with a Pravaz syringe holding 1 c.c. and divided into tenths. Each one-tenth thus represented two-tenths decimilligram of cantharidin. The dose commenced with one-tenth, and was increased to eight-tenths of the contents of the syringe. He never observed nephritis in any case. In a case of fresh lupus, previously untreated, he succeeded in healing without a cicatrix. He therefore recommends its use early. He believes the manner in which cantharidin acts proves the views of the bacteriologist as to the contagion of lupus to be wholly wrong.

Thiosinamin in Lupus.—Van Hoorn² has used injections of thiosinamin

¹ Berl. klin. Woch., No. 14, April 8, 1895.

² Monatsh. f. prakt. Derm., June, 1894; Ther. Gazette, Sept. 15, 1894.

in the treatment of lupus. When the treatment could be systematically followed there was nearly always improvement. Two c.cm. of a 15 per cent. alcoholic solution was used in some cases, but it was found that a 10 per cent. glycerol solution gave less pain. As a result of his experience the author thinks that it is not wise to begin at once the thiosinamin treatment, but to keep it in reserve till other methods have failed.

Treatment of Lupus Vulgaris.—Taylor¹ from his experience draws these conclusions as to the treatment of lupus vulgaris: 1. Excision should no longer be practised except when lupus attacks a finger or a toe and has proved rebellious to other treatment; 2. Scraping and subsequent cauterization with chemic caustics is the most satisfactory method of treating lupus of the trunk, extremities, and mucous membranes, and this plan may also be applied to the face when the disease is of trifling extent; 3. Scraping, followed by the use of the thermocautery, is quick, thorough, and efficacious, and has answered admirably in cases of facial lupus whether large or small areas have been dealt with; 4. Linear scarification is the remedy par excellence for extensive lupus of the face when mutilation and scarring have to be avoided.

The Treatment of Leprosy.—Morrow,² among other conclusions as to the treatment of leprosy, gives the following: 1. There is no substance known which, introduced into the body, is capable of destroying the lepra-bacilli without destroying also the cells which contain them; 2. The treatment of leprosy by tuberculin has been disappointing in its results; 3. The treatment of leprosy is empirical; 4. The more or less rapid development of leprosy depends upon the resistance of the tissues. In a few cases the resistance has been sufficient to destroy the germ, as is shown by rare instances in which indisputable signs of the disease have disappeared; 5. This capacity of resistance may be strengthened by change of climate, improved habits of living, and measures calculated to build up the health; 6. The remedies that experience has shown to be of most value are chaulmoogra oil, gurjun oil, arsenic, and certain members of the strychnin family; 7. When general dissemination of the bacilli has occurred treatment is futile; 8. The local surgical treatment is of much importance; 9. Though no definite hope of cure can be at present held out to the leper, his condition may be made more bearable and his life prolonged.

Treatment of Epithelioma of the Skin.—Hartzell³ states that caustics should be used in the treatment of superficial epitheliomata more than they are. One of the best of this class of remedies is pyrogallie acid. As its action is slow, it is easy to regulate the amount of destruction, and the drug is less painful than others of the same class. If it is desired to get a deep action from the drug, the eschar must be from time to time removed with poultices and the remedy reapplied.

Bloom⁴ reports a case of epithelioma on the cheek of a man sixty-five

¹ Med. Press and Circular, Nov. 7, 1894.

² Am. Jour. of the Med. Sciences, Sept., 1895.

³ Therapeutic Gazette, Nov. 15, 1894.

⁴ Jour. Cutan. and Genito-urin. Dis., April, 1895.

years old which was as large as a dollar and very much indurated. The sore had been present for five years, but its growth had been slow till three months before the reporter saw it, when it had progressed rapidly. As the condition of the patient did not justify any serious surgical procedure, the author determined to make use of lactic acid. Pure lactic acid and silicic acid were made into a paste and applied once a day. This did not cause so much pain as was expected, and more lactic acid was added. In a comparatively short time the induration had disappeared, and the sore took on healthy granulation and healed with a normal cicatrix. [In pronouncing any chronic ulcer to be a carcinoma it is of the highest importance to substantiate such an opinion by the microscopic examination. We saw not long ago an ulcer on the forehead of an old woman which was clinically an epithelioma, but which healed under an indifferent salve applied by a quack.]

Brocq¹ refers to Darier's method of treating epithelial tumors of the skin by methyl blue. In practice Darier first rids the ulcer of any crusts. If the borders are very thick, they are lightly touched with the galvano-cautery in order that the chemic agents may the more readily penetrate into the deeper layers. The cleansed surface is covered with a cotton compress wet with 10 per cent. solution of cocain, and is then painted with a solution of methyl blue in equal parts of alcohol and glycerol (1 part of methyl blue to 10 parts of the mixture). All the parts colored blue are then touched with a steel stylet moistened with a 5 per cent. solution of chromic acid, when a purple coloration results. The blue is then again applied and wet dressings are fixed upon the sore. This is repeated every second day for four or five times, and then the methyl blue alone is used. In deep forms of epithelioma Darier claims good results from interstitial injections of the blue. [We not long since made use of an ointment containing 5 per cent. of methyl blue in the treatment of a case of Paget's disease with benefit, a considerable portion of the ulcerated surface, which was very extensive, healing under this treatment.]

Ichthyol-zinc Paste in Eczema of the Female Genitals.—Von Sehlen² recommends the following paste in eczema of the female genitals:

R. Ichthyol,	from 1½ to 2 parts.
Powdered starch,	
Flowers of zinc,	āā. 12 “
Vaselin,	25 “

An ointment containing a high per cent. of calomel will often allay the intense itching.

In l'Hôpital Saint-Louis³ the following is considered the best medicinal varnish:

¹ Jour. Cutan. and Genito-urin. Dis., Oct., 1894.

² Monatsh. f. prakt. Derm., July, 1894.

³ Gaz. médicale de Paris, July, 1894.

R. Gum lac,	270 grams.
Benzoin,	10 "
Balsam of tolu,	10 "
Phenol (crystals),	180 "
Essence of cinnamon,	6 "
Saccharin,	6 "

Pure alcohol to make 1 liter.

[In the above varnish the amount of phenol, 15 per cent., seems unnecessarily large, and it would probably be well to use a smaller quantity.]

Alkaline Treatment of Eczema.—In the discussion on eczema at the British Medical Association,¹ Pearse called attention to the fact that one of the principles involved in the treatment of eczema was that an alkaline solution applied to a weeping surface would check an alkaline secretion. He therefore applies to weeping eczemas alkaline solutions, beginning with weak ones and increasing their strength as the process becomes less acute.

Treatment of Seborrheic Eczema.—In the treatment of seborrheic eczema Unna² recommends that the parts be first washed with soft soap dissolved in alcohol to remove the crusts and scabs, after which a small quantity of the following paste is well rubbed in, some being allowed to remain on the surface in the form of a powder :

R. Zinc oxid,	ʒjss ;
Precipitated sulphur,	ʒj ;
Powdered tale,	ʒss ;
Benzoated lard,	ʒvij.

This paste is to be used four times daily. If much irritation is produced, the paste is suspended for a few days, being replaced by some soothing application, such as cold cream. When the treatment is well borne, 5 to 10 per cent. of ichthyol is added to the paste in cases in which the affection is hyperemic, and a similar amount of resorcin if the disease is of the anemic type.

In cases where, on account of irritability of the skin, a mild, prolonged treatment is required the following is recommended :

R. Resorcin,	ʒij ;
Glycerol,	ʒij ;
Alcohol,	ʒivss.

This is diluted with 4 parts of boiling water, and thin layers of cotton steeped in it are applied to the affected parts under a water-proof dressing. These dressings may remain on permanently or may be applied at night. In cases of generalized seborrheic eczema the body is washed every evening with warm water to which has been added for adults 75 gr. and for children

¹ British Med. Jour., Sept. 22, 1894.

² Medical Week, July 6, 1894.

30 gr. of resorcin to each liter of water. In addition the patient should wear a flannel shirt steeped in this solution; at night a resorcin dressing should be used, and during the day the sulphur paste should be employed.

Tincture of Coal-tar in Certain Skin Diseases.—Leistikow¹ thinks that coal-tar is better as an antipruritic than wood-tar. It is a valuable remedy in the treatment of dry eczema of the scalp, neck, and external genitals. It is also valuable in psoriasis and trichophytosis. The remedy should be used only on limited areas at a time, as it may determine an intoxication. The formula recommended is :

R̄. Coal-tar,	5jss ;
Alcohol (95 per cent.),	5j ;
Sulphuric ether,	3ss.

Apply with a brush.

Treatment of Eczema Pilare of the Upper Lip.—Perrin and Aslanian² advise that in the treatment of eczema of the moustache the hairs be kept cut close. The lip and nostrils are to be washed several times a day with a lotion of absolute alcohol supersaturated with boric acid. This destroys the staphylococcus aureus, which is the most important factor in the production of this form of eczema. An important point in treatment is to avoid taking cold, as the discharge from the nose greatly favors the development of eczema of the upper lip.

Treatment of Professional Eczema of the Hands.—When it is important that a patient suffering from eczema of the hands should continue at his work, Unna³ advises the use of the following pastes :

R̄. Zinc oxid,	5x ;
Prepared chalk,	
Lead lotion,	
Linseed oil,	āā. 3v.—M.

Or,

R̄. Zinc oxid,	
Sublimed sulphur,	
Prepared chalk,	
Linseed oil,	
Lime-water,	āā. 3v.—M.

These pastes are suitable in the milder forms of eczema. Before going to bed the patient carefully cleanses his hands and nails with soft soap if the eczema be dry, or with weak soapsuds if he has a moist form of the disease. After the hands have been dried a thin coating of the paste is applied, rubbing it in till it is dry. Over this is placed guttapercha tissue, thin strips being wrapped spirally around each finger. The whole hand should be covered with cotton wool like a mitten. The next morning the dressing is allowed

¹ Medical Week, Nov. 2, 1894.

² Ibid., Dec. 7, 1894.

³ Monatshefte f. prakt. Derm., Bd. xix., No. 11, p. 628.

to remain on while the patient goes about the first rough work of the morning. The dressing is then removed and a small quantity of the paste rubbed in, which is allowed to remain all day. Each night the dressing is repeated. In certain cases, especially those of long standing, after almost all the hand is cured there will remain patches of eczema here and there. These are to be touched several times a day with a chrysarobin stick and then covered with the paste and guttapercha tissue. The chrysarobin stick is made as follows :

R. Chrysarobin,	5ij ;
Lanolin,	5iiss ;
Wax,	5vj.

Melt and pour into glass tubes, and when cold remove and cover with tin-foil.

In the case of those who are obliged to handle lime, plaster, and cement the hands must be protected during their work. This can be done by causing the patient to rub his hands before starting to work with tar diluted with a little castor oil and alcohol. This is both curative and protective, besides neutralizing the alkaline action of the lime.

In cases in which an invisible protective is necessary this can be attained only by stimulating the corneous layer of the skin by resorcin. For this purpose the following paste is used :

R. Zinc oxid,	gr. xv ;
Vaselin,	5iiss ;
Resorcin,	5iiss ;
French chalk,	5ss.

On going to bed the patient first rubs his hands with this paste and then with vaselin. In the morning he again greases his hands, but does not wash till the day's work is done. The result of this treatment is that a thick corneous layer is formed which acts as a protective. When this exfoliates the treatment is again applied, and so on till the parts have entirely healed.

The author insists on the importance of treating the seborrheic eczema which generally exists in these patients on some part of the body, as from this source the hands, irritated by the occupation of the patients, are infected.

Psoriasis Palmaris.—Purdon¹ recommends the following ethereal tincture of salicylic acid, not only in psoriasis palmaris(?), but also for corns and callosities :

R. Rectified spirits of wine,	5v ;
Sulphuric ether,	5iij.

Mix, and then add gum mastic gr. xxv ; when dissolved, add salicylic acid 5j. In place of the salicylic acid, "goa powder" can be used.

¹ Dublin Jour. of Med. Sci., Jan., 1895.

Treatment of Psoriasis.—Barendt¹ thinks that the most useful drugs in the treatment of psoriasis are chrysarobin, betanaphthol, pyrogallie acid, gallanol, and mercurial preparations. The most generally useful of the drugs is chrysarobin, but it has the drawback that it stains the linen. Where only a few patches are to be treated, chrysarobin is best used in a solution of guttapercha, but when the disease is very disseminate it is most efficient when applied as an ointment. For the face and scalp the ammoniated-mercury ointment is one of the most appropriate remedies. Betanaphthol does not produce any dermatitis, and may be used over the whole body, but its action is slow. Pyrogallie acid is liable to cause intoxication, and cannot be used in out-patient practice. Gallanol may be used in adeps benzoatus in the strength of 3 to 25 per cent. This is rubbed in night and morning, and a bath with green soap is taken twice a week. After every trace of psoriasis has disappeared the important thing is to prevent reinfection. This is to be accomplished by applying to the whole body twice a week an ointment containing 2 per cent. of salicylic acid or the same amount of betanaphthol.

Gallanol in Psoriasis.—Joseph² states that, though chrysarobin is the most powerful local remedy in the treatment of psoriasis, it has certain disadvantages, such as causing dermatitis and discoloring the hair and clothing. Gallanol is free from these disadvantages, and in mild cases is an efficient application. It can be used in liquor guttapercha or as an ointment in 10 per cent. strength.

MISCELLANEOUS DISEASES.

Acanthosis Nigricans.—Darier³ reports the case of a man thirty years old who had suffered for a number of years with persistent vomiting, loss of weight, and certain local signs that pointed to the presence of a gastric cancer. Only a few weeks before the examination the skin had become affected with the disease for which the patient sought advice. The regions involved were the face, the neck, the hypogastrium, and the flexures of the joints. In these parts the skin was pigmented in degrees varying from a yellow color to almost black, and presented a rough shagreen aspect. There was no sebaceous or other layer covering the affected skin. Upon the back were situated a number of papillomata and many nevi (pigmentary). The papillomata had appeared in the last six weeks, and although the nevi had always been present they had recently grown in size. The author calls attention to the fact that all the cases of acanthosis nigricans that have been reported seem to have been associated with malignant affections of the abdominal viscera. He thinks this association may be explained either by autointoxication or by the action of the carcinoma upon the sympathetic system; he is inclined to attribute the cutaneous dystrophy to the latter cause.

¹ Provincial Med. Jour., May 1, 1894. ² Monatshefte f. prakt. Derm., Bd. xx., No. 1.

³ Annales de Derm. et de Syph., Feb., 1895.

Acne Necrotica.—Dubreuilh¹ has by an extended experience been able to reach the conclusion that the affections that have been described under the names *acne pilaire*, *acne frontalis seu varioliformis*, *lupoid acne*, and *acne necrotica* are really one disease. The primary lesion is a papule the size of a lentil, of a bright rose-color, and firm to the touch. The summit is generally pierced by a hair. In a few days the top of the lesion presents a yellow, waxy look. A crust develops from this which is yellow or brown and slightly depressed below the surface of the surrounding lesion. At the end of three weeks or longer the crust falls, leaving a depressed, supple scar. The hair in the scar is not destroyed. The seats of predilection of the eruption are the brow, the anterior border of the scalp, the temples, behind the ears, and at the sides of the neck. Rarely the eruption may extend to the trunk. The subjective symptoms are insignificant. The epidermis, in pieces excised from the lesions, was found to be necrotic, and sometimes this extended into the dermis. The process probably always begins at the orifice of a hair-follicle, but the hair-bulb is not involved. The disease must be differentiated from the syphilides. It is comparatively easy to cure the existing lesions. For this purpose a sulphur ointment suffices. It is difficult to prevent the successive crops.

Ainhum.—De Brun² reports a case of *ainhum* occurring in a girl eight years old. When she was three years old a spontaneous constriction had occurred at the base of the fifth toe of the right foot. The toe had become completely detached from the foot at the age of seven. Furrows were during this time also forming about the fourth, third, and second toes. In some of these toes it could be shown that the process had not only involved the skin, but that the deeper tissues were also in an atrophic state, it being possible to thrust a pin through the toe without encountering any bone. Beginning constrictions were observed on both great toes. This is clearly a case of *ainhum*, since that is the only affection which will amputate a toe by the spontaneous formation of a noncongenital constriction. Both feet were enlarged, the skin of the plantar surfaces was thickened, and the feet were very cold and purplish in color. Pain in the lower limbs was complained of. Diminished touch, heat, and electrical sensation was noticed in both feet, most marked in the right. In walking a stiffness of the right leg was apparent, but no ankylosis of the joints existed. The author draws the points of distinction between *ainhum* and some forms of leprosy, and between *ainhum* and congenital amputations. *Ainhum* is confined to the toes and affects individuals who are well formed, while congenital amputation may affect any part, and those suffering from it show other evidences of malformation. The author concludes that the trophic, sensory, and motor disturbances noted in this case show that the constriction is not the primary element in *ainhum*, but is only a sign of what is going on in the deeper tissues.

Sklerodactylia Annularis Ainhumoides.—Von Düring³ reports the

¹ Archives cliniques de Bordeaux, Aug., 1894.

² Medical Week, Sept. 28, 1894.

³ Internationaler Atlas Seltener Hautkrankheiten, x.

case of a boy twelve years old in whom at the age of six there developed on both middle fingers a kind of erythromelalgia which affected the terminal phalanges. There were redness, swelling, and formication, but no pain. This condition got better and relapsed several times, till finally the entire finger was involved, the first and second phalanges being affected by a myxomatous swelling, while there was complete absorption of the terminal phalanx. At the time the notes were made the condition was as follows: All the fingers of both hands were affected. The bones were somewhat thickened. Some of the soft parts were much indurated, while some were still in a swollen condition. The terminal phalanges of the middle fingers, of the left index finger, and the fourth finger of the left hand were absorbed, and the skin covering the ends of the fingers sclerosed. On the right index finger a ring of sclerosed skin passed around the middle of the second phalanx, and the myxomatous swelling was particularly marked. The nails on all of the absorbed phalanges had shrunk to small and considerably thickened horny plates. Sensation in the affected parts was perfectly normal, and there was no evidence of neuritis nor of leprosy. There were no changes in any other part of the body.

A Rare Form of Angioma Serpiginosum.—Francis¹ reports the following case: Patient was three years old, and had been under the care of the author since the age of four months. At the time of birth a port-wine mark was noticed on the plantar surface of the right heel. In a few weeks similar nevi appeared on the peroneal surface of the right leg, and later on the outer surface of the right buttock. When first seen an unbroken bluish port-wine mark occupied the outer third of the plantar surface and outer border of the right foot. On the sole the nevus had a sinuous outline, and was bounded anteriorly and toward the median line by several isolated nevi which seemed to have a tendency to join the larger nevus. On the outer border of the foot the nevus extended nearly to the level of the malleolus and over the point of the heel. This nevus and its satellites were ill defined at the margins, and were of a bluer color than those on other parts of the limb, and disappeared on pressure. The lower half of the outer surface of the leg presented five separate nevi about 2 cm. in diameter, surrounded by a large number of smaller nevi. The large patches seemed to be formed by the confluence of the smaller ones. Most of the nevi disappeared on pressure, but there were in the larger patches certain dark-red points which did not disappear. The outer surface of the buttock and thigh presented three large nevi, with many smaller ones arranged in the long axis of the limb and similar to those on the leg. Four months later the patient was seen, and the disease had extended so that the lower two-thirds of the leg was affected, the thigh from the trochanter to a little below the middle was involved, while many new satellites had appeared. There was no evidence of any change in the deeper tissues. The patient was kept under observation, and the disease has been slowly progressing by the enlargement of the larger patches and the new

¹ Internationaler Atlas Seltener Hautkrankheiten, xi.

formation of satellites. The author remarks that it has been generally agreed that (a) angiomata are present at birth or become evident in early infancy; (b) they increase in size in proportion to the natural increase of the part upon which they are situated, and if this rule is transgressed the growth is strictly local and limited; (c) they are single or present in small numbers, and the nevi when multiple bear no special relation to one another; extension is by growth at the margins of the nevus. Within the last few years it has been noted that these rules are not of invariable application, and that nevi occur which present the following features: (a) they may appear during the earlier years of life; (b) they tend to increase in size out of all proportion to the increase in size of the part upon which they are situated; (c) they are multiple, and the growths have a definite relation to one another, being often arranged in streaks and with satellites grouped around the larger masses; (d) extension is not only by growth of the margins, but by the formation of new nevi.

White¹ reports a case of *angioma serpiginosum* which occurred in a boy twelve years old. Portions of the growth were sent to Darier and to Councilman and Bowen for examination. Dr. Darier found the growth to be made up of cells of the connective-tissue type with a great tendency to form new blood-vessels. He proposes the name *sarcome angioplastique reticulé*. Drs. Councilman and Bowen agree that, regarding only the histology of the growth, it presents much likeness to the angiosarcomas.

Asphyxia Reticularis Multiplex.—Unna² under this title describes a rare form of skin disease. The patient was a well-nourished woman forty years old. The disease began, three years before the author saw her, as a white thickening of the skin of the forehead, neither painful nor irritable. After a time the skin became red and painful, and the condition spread to the anterior half of the scalp and the upper half of the face. When this condition subsided, it left the forehead in a hard swollen condition and part of the scalp hairless. Ulcers had been developing on various parts of the body. When examined the whole skin, especially on the extensor surfaces showed an ichthyosis-like condition, being covered with thin scales which did not seem inclined to separate. The forehead was bluish-red, swollen, and hard, and in the morning often presented an edema. On the flexor aspect of the right arm were several small, round, shallow ulcers between which were some smooth cicatrices. A few similar ulcers existed on other parts of the body, and near all of them were to be seen the same kind of scars. The ulcers were not due to scratching, but developed spontaneously, being preceded and accompanied by pain. In the neighborhood of the ulcers and also on other parts of the body, especially on the legs and back, spots and streaks from a blue-gray to a violet color were to be seen. These streaks formed a sort of network on the body, the knotted points of which were more prominent as blue spots. Some of these points were elevated and

¹ Jour. Cutan. and Genito-urin. Dis., Dec., 1894.

² Internationaler Atlas Seltener Hautkrankheiten, x.

seemed about to ulcerate. It was evidently thus that the ulcers commenced. On the thenar eminence of the left hand was a small sinus from which thin pus exuded, and the patient stated that a splinter of bone had been removed. There was an alopecia on each side of the head above the ears. Aside from the condition of the skin the patient had no abnormality. The treatment found most successful was a dressing of the ulcers with ichthyol on wadding, a zinc-gelatin compress being placed over this. After two months' treatment the patient was discharged very much better. Microscopic examinations were made from which the author concludes that the disease was a multiple necrosis arising from an excessive universal venous stasis of the skin. The process was, however, more than a vasomotor phenomenon, as was shown by an extensive inflammatory proliferation along the vessels. What was the cause of this inflammation the author could not determine.

Symmetrical Cutaneous Atrophy of the Extremities.—Bronson¹ reports a case of the type of cutaneous atrophy which was first described by Buchwald. The patient was a man forty-five years old, who had first noticed his disease, fourteen years before, in the left ankle, the skin at this place becoming thinner and more sensitive and the blue veins showing more prominently. In the course of time the same changes appeared in the other limb and in the arms, while the affection became more extensive on the leg originally affected. The only subjective sensations complained of were occasional slight shocks of pain running through the limbs and a sense of great fatigue after long standing. At the time of the examination the skin from the hips down and the lower two-thirds of the arms were found affected. The color of the affected skin is a purplish brown due to the blood-vessels showing through the skin, which contains a sort of brown pigment. The skin is thrown into a multitude of wrinkles, and has a thin, glazed appearance, and the veins are more distinctly seen than normally. Near the outer malleoli of both legs are shallow indolent ulcers. On the legs, hands, and feet are white scars where the atrophy has been more profound, or in some cases where ulcers have previously existed. Hairs have almost disappeared from the affected regions, and no sweating is noticed. The sense of touch is not diminished, but hyperesthesia exists. No change in the deeper structures could be made out.

Elliot² adds another case of the same sort to those already reported. This case occurred in a man forty-five years old. The disease had begun on the left knee fourteen years before the examination, and had gradually extended up the thigh. The skin in this region presented much the same appearance as that described in the case reported above. Upon the right knee there was a patch 2 by 4 inches of recent date in which the same changes, less in degree, were to be noted. There were no subjective symptoms. The patient stated that the disease had begun with a purplish blush, and that after a time in the affected region there had appeared large veins,

¹ Jour. Cutan. and Genito-urin. Dis., Jan., 1895.

² Ibid., April, 1895.

and that then the skin had got thin. The author believes that the cyanosis was the first step in the morbid process, and that the cutaneous atrophy was secondary.

Darier's Disease.—Jarisch¹ regards this disease as a dermatosis affecting with predilection those regions of the body which perspire easily and considerably. An inflammation in the region of the papillary layer is at the bottom of the trouble. This in course of time induces an hypertrophy of the prickle-cells, which become thicker and increased in number, press down into the cutis, and thus produce a secondary increase in the length of the papillae. The process goes on to terminate finally in a hyperkeratosis. This hyperkeratosis is not confined to the mouth of the follicles, but is to be seen over the whole extent of the disease. The pigment is at the same time increased. In the further course of the disease a parakeratosis is developed; that is, a cornification of the cells with retention of the nucleus, without any previous secretion of keratohyalin. A partial degeneration of the rete-cells also occurs, as a result of which and mechanical effects lacunæ are formed in the rete. The peculiar formations described by Darier and classified as psorosperms, and looked upon by him as the cause of the disease, are nothing more nor less than degeneration-products. Jarisch believes them to be the product of degenerated nuclei of the epidermis-cells, which have become greatly swollen, and "acidophil." These lie for the most part free in the horny layer, but in the rete they are found encysted within the hyalin-degenerated body of the cell. Jarisch here draws attention to the coexistence of seborrhea of the scalp with Darier's disease, and believes there may be some internal relationship between these diseases, particularly as both manifest a predilection for the same parts of the body.

Dermatitis Hiemalis.—Corlett² has had several opportunities of observing the malady which has been described by Hutchinson under the title "Some Peculiar Eruptions allied to Chilblains." The author reports a number of these cases in detail. His conclusions in regard to the affection are: 1. It appears at the approach of cold weather; 2. it heals spontaneously in the spring; 3. it is liable to recur each year, occupying the sites affected before; 4. its characteristic position is the dorsal aspects of the hands, next in frequency the dorsal surfaces of the feet; 5. the disease shows little tendency to spread to other parts of the body, nor do the lesions, once fully developed, spread at the periphery; 6. the eruption consists of variously-sized round or horseshoe-shaped patches, which are thickened, having an abrupt, well-defined margin. The lesions are of a dusky-red color. At first vesicles are present, which soon rupture and leave denuded spots of a deep-red color. The disease at this time may present a striking likeness to herpes. Later the patch is of a rose color and the surface is covered with dry adherent scales, at this stage looking like lupus erythematosus; 7. itching may not be present, but when it occurs it is paroxysmal;

¹ Arch. f. Derm. u. Syph., Bd. xxxi. Heft 2.

² Journal of Cutaneous and Genito-urinary Dis., Nov., 1894.

8. the malady is not associated with any other disease nor any special bodily condition.

Diagnosis of Dermatitis Herpetiformis.—Leredde and Perrin¹ found in the fluid withdrawn from the bullæ of patients suffering from dermatitis herpetiformis eosinophilous cells equal to from 30 to 95 per cent. of the total number of leukocytes. These elements are not present in appreciable quantities in any other similar affection, especially not in pemphigus.

Dermatoneuroses, and their Treatment.—Leloir² calls attention to the wide recognition which his views as to the importance of nervous influences in the causation of dermatoses have gradually gained. He divides the dermatoneuroses into—I. The purely sensory dermatoneuroses. Under this head come 1. different varieties of cutaneous hyperesthesia; 2. different forms of cutaneous anesthesia. II. Purely motor dermatoneuroses, the type of which is cutis anserina. III. Vascular dermatoneuroses, including certain cutaneous hyperemias and anemias, edemas and hemorrhages. IV. Trophic dermatoneuroses, which include 1. chronic erythemas and dermatitis, such as glossy skin, pellagra, and Morvan's disease; 2. papular affections, some forms of eczema and lichen; 3. vesicular affections, some forms of herpes zoster; 4. bullous affections, some forms of pemphigus; 5. pustular affections, certain ecthymas; 6. ulcerations, perforating ulcer; 7. gangrenes, symmetrical gangrene of the extremities; 8. certain chronic edemas; 9. certain scleremas; 10. scleroderma (?); morphea (?); certain atrophies; 11. nerve-leprosy; 12. certain ichthyotic conditions; 13. certain hyperkeratinizations; 14. disturbances of pigmentation. V. Glandular dermatoneuroses—1. of the sweat glands; 2. of the sebaceous glands; 3. of the hair-follicles; 4. dermatoneuroses of the nails.

In the treatment of the dermatoneuroses Leloir thinks it is of great importance to prevent contact with the air and to avoid mechanical irritation and sources of local infection. These indications are accomplished by pastes or ointments spread in thick layers and covered with wadding, or the gelatins of Pick and Unna used in the same way; the soaps of Pick, medicated varnishes, plaster-mulls, and knitted garments of various tissues are all used for the same purpose. In certain violently pruriginous cases accompanied by sudden edema the making of numerous punctures into the part with a needle has proved of benefit. Counterirritation locally or to the spine is of use in properly selected cases. In 25 severe cases of localized or general pruritus the induced current has been used with excellent results. The current is used in this way: The patient is connected with one pole of a powerful static machine. A metallic point connected to the other pole is held at about 0.10 c. from the affected area, being passed slowly over the whole surface. The patient feels as though a gentle breeze were blowing upon the parts. A sitting lasts from twelve to fifteen minutes. Among drugs for internal administration the most useful are quinin, valerianates, ergotin, strychnin, hyoseyamin, iodobromid of camphor, and arsenic. Hygienic regulations,

¹ Medical Week, May 3, 1895.

² Brit. Jour. of Dermatol., Nov., 1894.

rest, gymnastics, isolation, etc. demand our most careful consideration in each case. It is in the highest degree important to correct as far as may be any affection of any organ which may act reflexly as an irritation to the nervous system. Some toxic agent may lie back of the dermatoneuroses, and must be eliminated; alcohol, tobacco, coffee, and other drugs which men are in the habit of taking come under this head.

The Neurotic Origin of Hydrocystoma.—Hutchinson¹ reports a case of hydrocystoma which occurred in a woman sixty-four years old. She had for many years been afflicted with right hemicrania. She was brought to the author on account of a persistent sweating of the right side of the face. At this time the little cysts with which the face of the patient was covered were noticed; according to her statement, they had been present for about ten years. The cysts resembled sago-grains and were very tense, varying in size from a pinhead to a pea. The lesions were very abundant in the region of the eyelids, and were more abundant on the right than the left side. They occurred also on the eyebrow, the forehead, and the nose. A few globular nevi and tufts of dilated venules were seen about the cysts. The author thinks that there must be some pathologic relation between the repeated attacks of hemicrania and the appearance of the rash.

Epidermolysis Bullosa.—Elliot² reports 2 cases of the rare affection which has been called epidermolysis bullosa. The first occurred in a male aged thirty whose father had suffered from a similar trouble. The disease first manifested itself when the patient was five years old. The lesions presented were tense, deep-seated bullæ, which appeared after irritation such as rubbing the parts, or from the use of instruments such as a hammer or screw-driver. The lesions affected only the hands and feet, and were most apt to occur in summer. The patient suffered from hyperidrosis of the hands and feet, and often there was a bromidrosis of the latter. The bullæ were not surrounded by any redness nor were other clinical signs of inflammation to be noted. The only subjective symptom was pain after the bullæ had ruptured. The second case occurred in a male twenty-one years old. There was no history of hereditary predisposition. The cutaneous trouble had existed ever since the patient could remember. The lesions were similar to those just described, except that they occurred upon any part of the body exposed to friction of even the slightest kind. The patient was affected with general hyperidrosis, and the skin-trouble was worse in summer. In neither of the cases was treatment of any avail. The author made microscopical studies of fresh bullæ and found evidences of inflammatory infiltration about the vessels of the cutis, and he regards the malady as a dermatitis developing in an individual with an acquired or hereditary exaggerated irritability of the cutaneous vascular system.

An Epidemic Skin Disease.—Savill³ makes some further remarks on a form of skin-disease which he first described in 1891. The disease may

¹ British Jour. Dermatol., May, 1895. ² Jour. Cutan. and Genito-urin. Dis., Jan., 1895.

³ Lancet, Sept. 29, 1894.

occur in an epidemic form or sporadic cases may occur. It is not so rare as was at one time thought, as in three years nearly 600 cases have been reported in London. The disease is very likely in its earlier stages to be mistaken for other skin-diseases on account of the diversified forms which it may present. The commonest mode of commencement is a papular rash arranged more or less in constellations, attacking symmetrical parts of the body. Quite commonly it commences as an erythema. The first stage of the disease is very transitory, lasting only a day or two. Then succeeds that which is characteristic of the malady, a branny desquamation, which occurs not only on those parts affected by the rash, but also on other parts of the body. The constitutional symptoms are marked and the disease may terminate fatally. The malady runs a course of from six to eight weeks.

Bell's Paralysis occurring with Herpes Zoster.—H. A. Spencer¹ reports the case of an old woman who, while suffering from a subacute attack of rheumatism, developed neuralgia of the right side of the neck and face with an eruption of herpes zoster. The eruption followed the course of the superficial cervical plexus and the facial nerve. After a few days a complete Bell's palsy occurred. In the course of four months, under treatment, the palsy disappeared.

Herpes Zoster affecting the Frontal and Dorsal Regions simultaneously.—Bradshaw² calls attention to the great infrequency with which herpes zoster affects two widely separated regions. He reports the case of a middle-aged man who presented the lesions of the disease on the left side of the thorax, on the inner aspect of the left arm, and on the left side of the forehead. The author refers to a case of Mr. Hutchinson's in which the right side of the chest and the left side of the forehead were affected.

Herpes Zoster caused by Mental Disturbance.—Roche³ narrates several cases in which an eruption of herpes zoster has followed some cause producing mental emotion or anger. The author believes that it is not unreasonable to think that the herpes was really caused by the mental emotion, as there are in medical literature many examples of mental disturbance apparently causing trophic changes.

Hydroa Vacciniforme.—In March, 1894, a woman consulted Dr. L. Brocq⁴ for an eruption which occupied the nose, cheeks, jaws, and the ears. This eruption had been coming at intervals since the patient was a child, and a slight exposure of the face to the direct rays of the sun always seemed to be the exciting cause. The eruption consisted of numerous vesicular lesions from a small to a large pea in size. The smaller ones were pearl-like, semitranslucent, and surrounded by an erythematous areola. The larger and older lesions consisted of a brownish or purplish center surrounded by a yellowish ring somewhat elevated, and beyond this an erythematous border. The color of the centers seemed as if due to interstitial hemorrhage. There were many small white scars left by former attacks.

¹ Lancet, June 9, 1894.

² Ibid., Oct. 13, 1894.

³ Ibid.

⁴ Annales de Dermatol. et de Syph., Oct., 1894.



Mr. Hutchinson's case of hydrocystoma
(British Journal of Dermatology, May, 1895).



If a lesion were pricked with a needle, a small amount of clear fluid escaped, but the wall of the vesicle did not entirely collapse. The only subjective sensation was a slight burning. The woman was ordered to remain in the house, and in fifteen days from the onset the eruption had disappeared. The most prominent factor in the etiology of hydroa vacciniforme is exposure to the direct rays of the sun, but this is not the only cause, since a raw and cold wind, or even artificial heat, has been observed to produce it. Young children seem especially liable to the malady, and this tendency often grows less as the child grows older. We have to explain the peculiar effects of the sun on some skins by presupposing a personal idiosyncrasy. Usually other members of the same family are exempt from the disease. The disease may be ushered in with malaise and febrile symptoms. The first lesions are said by some authors to be erythematous spots or papules. The author did not have an opportunity to observe this in his case. Pathologically, the lesions are found to consist of localized necrotic areas involving the deeper layers of the epidermis and the true skin. Treatment can be only prophylactic, and must consist in the avoidance as much as possible of exposure to the sun's rays. It is well for persons who have a susceptible skin and who must be out of doors to wear a protecting veil. For the treatment of the lesions a simple ointment is to be most recommended.

[It has been shown that the smearing of the face with a brown pigment will protect from the sun-erythemas experienced by those who ascend high mountains, and it seems likely that the same procedure might be of avail in hydroa vacciniforme.]

Impetigo Herpetiformis.—Dauber¹ calls attention to the fact that the etiology of impetigo herpetiformis has been variously explained. Some believe it to be a pyemic process, others a neuropathic reflex dermatosis. Kaposi, Auspitz, Zeissler, Dubreuilh, Brier, et al. have found purulent processes within the body in cases under their observation. The author reports a most interesting case of a patient who had four recurrences of the disease, dying from the last. This patient acquired toward the end a rapid tuberculosis of the lungs and larynx. The exanthema receded more and more as the strength became lowered, until at her death, one and a half years after the fourth recurrence of the disease, nothing but the pigmentation and a few ulcers on the mucous membrane of the cheek and at the angle of the mouth were to be seen. The bacteriologic examination of the pus from fresh pustules showed a pure culture of streptococcus pyogenes aureus. Histologic examinations were made of pieces of skin from the more deeply pigmented spots and where the ulcers existed at the time of death; also pieces of the spinal cord, medulla, pons, Gasserian ganglion, the ganglion supremum of the sympathetic of the neck, and a piece of the third branch of the trigeminus were examined. All the pieces of skin showed a marked small-celled infiltration. A slight pigment-accumulation was found in the papillæ of the pigmented areas. The vessels showed a fairly well-marked

¹ Arch. f. Derm. u. Syph., Bd. xxviii. Heft 2 u. 3.

infiltration of the adventitia, and the lumen was enlarged. Nothing abnormal was to be seen in the sebaceous glands; on the contrary, the sweat-glands showed a richer accumulation of small cells about them than was normal. The examination of the parts taken from the nervous system was likewise negative. In the cervical and dorsal portions of the cord the tracts of Goll showed a much clearer coloring macroscopically. Microscopically, they were found to be richer in gliomatous tissue than the other parts of the cord. The central canal throughout was enlarged, and nowhere was the ependyma to be plainly seen. There is nothing in these findings to explain the cause of impetigo herpetiformis. Studying the question with relation to symptoms, they naturally divide themselves into two classes, those that occur always or very frequently, and seem to have some causal relationship, and those that are less frequently observed, and are accidental complications. In the first instance the high fever, chills, and the prodromal malaise and headache, the nephritis and enlargement of the spleen, and, not least, the pustular eruption, are all symptoms which we regard as characteristic of infectious diseases. Certainly such a grouping of symptoms is not to be explained by a reflex neurosis from the genital organs, more particularly since men also are affected and the disease occurs where no lesions of the genitals exists, nor even pregnancy. The frequent occurrence of impetigo herpetiformis with pregnancy is certainly very striking, but can be explained when one considers how the entire organism is irritated and the resistance of the entire system is so lowered as readily to permit the ingress of a poison. The staphylococcus pyogenes aureus found in the pus of the pustules cannot alone be looked upon as the cause; much more probable is it that the cause lies in some toxic influence, and that perhaps a specific one. The part that heredity plays cannot yet be determined, as the observations have not been sufficient. As regards the pathologic conditions found at autopsies, very striking is the frequent association of impetigo herpetiformis with septic processes in the body, and the changes in the kidney, spleen, liver, and stomach, which can be induced only by some chemico-toxic poison. According to these observations, the process is a dermatitis with the formation of small abscesses. It would thus seem that impetigo herpetiformis is an acute or chronic infectious disease.

The Impetigo of Duhring.—Roberts¹ reports a case of the rare affection which Duhring has described as the true impetigo. The patient was a child three years old and of wealthy parents. The eruption was preceded by smart fever, which quickly fell, and when the child seemed to be convalescing a small crop of pustules appeared. After an interval a fresh crop came out, but this time there was no fever. When seen by the author there were upon the body of the child about a dozen pustules, one of which had come half an hour before the visit and was already entirely pustular. All the fresh pustules were surrounded by a red areola, which faded as the lesion matured. When fully developed the pustules were semiglobular, the size of

¹ British Jour. of Dermatol., May, 1895.

a pea, with walls which were so hard and dense as to suggest small-pox. None of them was umbilicated. The lesions gradually dried up into scabs. Although there were other children in the family, none of them developed any similar eruption.

Milium Congenitale (en plaques).—Crocker¹ reports 2 cases of a peculiar congenital eruption which he believes to have been milium. The first case was seen when six weeks old, and the eruption had not altered materially since birth. The eruption was aggregated into patches slightly raised above the level of the surrounding skin. The patches were on the right side of the face in front of the ear, across the front of the neck, on the lobe of the left ear, on the left side of the scalp above the ear, on the left cheek, on the left ala nasi, and several small patches were in the neighborhood of these larger ones. The largest patch was upon the occiput, its diameters being $9\frac{3}{4}$ by $2\frac{3}{8}$ inches. The color of the patches was a pale reddish-yellow, but the color was redder when the child cried and paler on exposure to cold. The surface of the plaques was finely granular, consisting of closely aggregated, minute, yellow papules. In the borders of the patches, and less frequently in other portions, were to be seen comedones, and some of these had suppurated. At a later examination there was found on the buttocks a papular and scabbed eruption, and as the child suffered from snuffles it was given mercury, but without effect. The child emaciated, and died at the age of nine months with gastrointestinal symptoms. The microscopic examination of a portion of one of the patches showed that the sebaceous glands were unusually large, and in many places the component lobes were separated by bands of new-formed connective tissue. The author saw several years after another case precisely similar, except that there was only one patch and there was no suspicion of syphilis. The conclusion of the author is that there had been a deep-seated inflammation of the corium during intrauterine life, which had resulted in atrophy of the appendages of the skin, leaving only the milium-like structures to represent them.

Mycosis Fungoides.—Thomson² reports a case which he believes to have belonged to "that class of affections known as mycosis fungoides." The patient was a girl fourteen years old. The disease first made its appearance seven months before the examination. The skin lesion of the most importance was in the lumbar region, and looked as though a large butterfly had lighted upon the back. This appearance was due to two large plaques of a bluish color covered with scales. The affected skin was elevated half a centimeter, and rose abruptly from the surrounding skin, the borders having a sinuous outline. The affected skin was firm and elastic to the touch. At one point there was a slight excoriation giving rise to a serous discharge. There were several small plaques of a similar character on both buttocks and on the right thigh. At first mercury was given, under the suspicion that the affection was a syphilide, but this had no effect. Locally the patches were touched with chromic acid and ichthyol in an ointment or varnish. The im-

¹ Internationaler Atlas Seltener Hautkrankheiten, x.

² Ibid., xi.

provement was very rapid. Only a little superficial scarring was left. A microscopic examination revealed granulation tissue such as may be seen in the neighborhood of scrofulous glands. In the superficial parts of the growth were spaces filled with small granules which proved to be small streptococci. These inoculated upon guinea-pigs determined scaling with loss of hair, but no lesion resembling those in the patient.

Universal Dermatitis, probably a Rare Variety of Mycosis Fungoides.—Morris¹ relates the case of a man who had had for many years a disease which had appeared first upon the arms and legs, and which was usually regarded by physicians who saw the case as eczema. At times the disease would entirely disappear, but it relapsed, especially during visits to India. At the time the patient came under the care of the author his general health seemed unaffected. The skin of the whole body except the face, the scalp, and the front of the chest was of a mahogany color. The skin of the lips was so thickened that it could not be pinched into folds, and was of a mottled appearance due to hemorrhagic spots. All over the thickened and reddened surface were scattered crops of vesicles and boils. The nails were deformed, and the toes beyond the nails were tense with a serous accumulation. The glands in the right axilla and the groins were much enlarged. The hair on the pubes had disappeared. The abdomen was in a condition similar to that upon the limbs, but less in degree. The front of the chest below the nipples was covered with dark papules the size of a pin's head. The back, the buttocks, the face, and the scalp presented similar lesions. The most striking lesions were three ulcers—one on the back of the right hand, one on the right temple, and the other on the left cheek. The largest was the size of a florin, and all had elevated borders somewhat infiltrated, and were covered with a dry, brown scab. The patient suffered from itching at night, so that he could not sleep. The man was kept under observation, and in spite of treatment the malady advanced in a periodic manner, each exacerbation being preceded by a feeling of tension in a part, after which a crop of vesicles would appear. Sometimes, especially on the feet, bullæ formed. The patient finally left the hospital and died from an intercurrent attack of pneumonia. A microscopic examination revealed a condition which might be found with a number of the chronic inflammations of the skin, but in addition there were certain cell-inclusions which were thought to represent psorosperms. The author thinks that his case corresponds more to mycosis fungoides than to any other described malady.

[In reading the clinical history of this case one is struck by the moist type of lesions that seem to have constituted the essential elements of the eruption. The rash of the "premycotic stage" of mycosis fungoides is usually an erythema or more chronic form of eczema.]

Eruption Cheloid.—William Anderson² reports two cases of an eruption that resembled in its histology cheloid, and which supervened upon another

¹ British Med. Jour., June 2, 1894.

² British Jour. of Dermatol., Nov., 1894.



Mr. Morris' case of universal dermatitis
(British Medical Journal, June 2, 1894).





Mr. Morris' case of universal dermatitis
(British Medical Journal, June 2, 1894).

eruption which in both cases resembled lichen planus. In one of the cases the lesions were situated upon the back, slightly elevated above the skin, of a peculiar milky whiteness, and did not present the claw-like processes which characterize Alibert's disease. In the other case the lesions appeared upon the backs of the hands. In both cases the eruption disappeared without leaving scars.

Multiple Benign Cystic Epithelioma.—White¹ reports a case of this rare affection which occurred in a woman forty-five years old. The first change noted in the skin occurred at the age of twenty-four, when a few colorless pimples appeared on the face. During all the years before the clinical notes were made new lesions had continued to develop. In the last two years her health had been failing. At the time of the examination there were upon the face about fifty lesions, which could be classified as—(1) Flat papules the color of the skin and of the same consistence, from a pinhead to a pea in size; (2) Larger lesions, some of them as large as a quarter-dollar, of a red color and not much elevated, with smooth surfaces; (3) Others of medium size that are depressed in the center, or have begun to soften and are covered with dull-brown crusts of no great thickness; (4) Two or three lesions much more prominent, and with perpendicular edges and depressed centers, resembling Hutchinson's crateriform epithelioma; (5) The right upper eyelid presented an elongated irregular ulcer with infiltrated borders and partly covered by crusts. The inner portion of both lids of the left eye and the side of the nose are the seat of an ulcer the inner border of which is extremely hard; (6) Smooth white scars where lesions have been destroyed by caustics. Microscopic examination showed the lesions to be made up of epithelial masses in the corium, in the midst of which were cysts. The author calls attention to the fact that his case differs from most of those reported in that the lesions were larger, no milia were seen, the lesions were not translucent, and most remarkable was the change to what seemed to be true epitheliomata in some of the nodules. The author is inclined to believe that this change is what will be found to be the rule in all cases of the so-called benign epitheliomata if they have existed long enough, as the tendency of all epithelial new growths is to break down.

Xanthoma Multiplex.—Stout² reports the case of a woman fifty years old who had been jaundiced for four years. Five months before the examination she had begun to develop xanthomatous lesions on both eyes. At the time of examination the lesions were found scattered over almost the whole body, but especially on the palms. The whole surface was deeply jaundiced, and on palpation in the region of the liver hard nodular masses could be felt. During five months of observation the lesions had not changed nor had new ones appeared.

[Some years ago we recorded a case of xanthoma multiplex developing in a man who had for a long time suffered from jaundice. The great peculiarity of this case was the spontaneous disappearance of the xanthomatous lesions.

¹ Jour. of Cutan. and Genito-urin. Dis., Nov., 1894.

² Ibid., June, 1894.

The jaundice of a very profound character persisted till the death of the patient, which occurred some twenty years after he had first become yellow. Postmortem the liver was found in a very marked state of cirrhosis.]

Papillomata of the Buccal Mucous Membrane.—Rasch¹ reports two cases of a rare affection of the mouths of children which consisted in the presence upon the gums and cheeks of many small tumors varying in size from a millet-seed to a split pea. The mucous membrane over the smaller tumors was healthy, but over the larger it was somewhat broken and ragged. In one of the cases there was upon the hands ordinary warts, and it was shown that this child was in the habit of sucking its fingers. Microscopically, the tumors of the mouth presented the structure of ordinary papillomata. The author is inclined to think that in this case infection from the hands to the mucous membrane of the mouth had occurred. He believes that many of the papillomatous growths of the nose and pharynx may have a similar origin. In these two cases a cure was effected by the use of the galvanocautery.

Malignant Pemphigus.—Neisser² presented at this congress a case of pemphigus of a malignant character. The malignity was evinced—(1) in the primary appearance of the bullæ on the mucous membranes; (2) in the formation of bullæ or the tearing off of strips of skin from the slightest pressure or injury; (3) in the condylomata-like growths from the skin. The treatment consisted of daily injections of strychnin in 0.005 doses, increased gradually to 0.008. Care must be taken not to continue the injections to the point of inducing symptoms of nervous irritation. The mucous membrane of the mouth was treated by a 10 per cent. solution of silver nitrate.

Perifolliculitis Necrotica.—Janovsky³ reports the case of a patient who presented the following history and lesions: The disease began eight weeks before the date of examination as a nodule the size of a lentil in the right submaxillary region, which was soon followed by another on the left side. These lumps broke down and ulcers formed. At the time of examination the skin on both sides of the face in the bearded region was infiltrated and rigid and partly immovable, as if it had become adherent to the bone. In the middle and at the most elevated point on each side was a deep ulcer, the edges irregularly sinuous, indurated, and steep. The large ulcers seemed to be formed by the union of smaller ulcers. In the immediate vicinity of the large ulcers were small ones and small indurated nodules evidently follicular in origin. Some of the nodules had become pustules and many were perforated by hairs.

Sclerema Neonatorum ending in Recovery.—Garrod⁴ reports the case of an infant five weeks old which seemed in perfect health save for the skin-affection. The back presented a remarkable induration which involved the

¹ *Annales de Derm. et de Syph.*, Jan., 1895.

² *Sep-abdr. aus. d. Verhand. d. IV. Deutschen Derm. Cong.*, Braumüller, Wien.

³ *Internationaler Atlas Seltener Hautkrankheiten*, x.

⁴ *Lancet*, May 4, 1895.

entire dorsal aspect, including the deltoid regions, the upper arms, the buttocks, and the thighs down to and involving the popliteal spaces. The edges of the indurated skin were sharply defined, irregular, and map-like. The affected skin was stretched, but not shiny, and exhibited a pink mottling; it could not be pinched between the fingers; pressure produced no pitting, but rendered the surface pale for a time. The induration upon the buttocks had been noted immediately after birth, and the region was at first of a deep pink color. During the first nine days the trouble had extended to the thighs, but only shortly before the examination had it attacked the arms. Inunctions of cod-liver oil were at first used, and under this there was little improvement. Then blue ointment by inunction was substituted, and improvement commenced. As the induration cleared up outlying patches of the affected skin were left surrounded by normal integument. No pitting could be produced even after the tension of the skin had decreased during recovery. The lowest rectal temperature was 98° F. In a little more than four months the skin had become normal. The treatment with mercurial ointment was stopped some time before recovery had occurred.

Strophulus Infantum.—Under this title Blaschko¹ describes a disease, closely resembling urticaria, occurring in infants, mostly in the first year, less frequently in the second. The disease is characterized by an eruption simulating bedbug bites; that is, prominent, firm, somewhat pointed, highly red papules, fading out toward the periphery. They occur isolated or in groups, with preference on the abdomen, buttocks, and thighs. Sometimes the papules are surmounted by vesicles, which are deep lying and dry up spontaneously, leaving a firm, itching nodule. When these papules are closely packed together, they give to the skin the appearance and feeling as of a file. Frequently a secondary eczema is added. In other cases there will be found in the usual positions, and in addition upon the soles of the feet and palms of the hands, large superficial blisters, which remind one more of pemphigus or hereditary syphilis. Many times the vesicles are to be found upon the trunk also, and when following upon a varicella, the error of regarding the case as a chronic varicella may be made. The etiology of these cases is still wrapped in doubt. Hutchinson regards them as "prurigo," which he says may follow upon varicella, vaccination, or measles. Comby regards the affection as a true urticaria, produced by abnormal fermentations in the digestive tract; in other words, an autointoxication. He regards a dilatation of the stomach as the anatomical basis for the fermentations, and, having found dilatation in rachitic children, looks upon both affections as dependent upon nutritive disturbances. Funk and Grudzaek observed also that these two conditions go hand in hand. The author, studying the etiology with these two theories in view, found that the strophulus could not be regarded as a symptom of rachitis, for out of 33 cases he found only 19 afflicted with rickets, and these in a very slight degree. Furthermore, he found that dilatation of the stomach was not a regular accompaniment of rachitis, and

¹ Berlin. klin. Woch., March 18, 1895.

hence the anatomical basis for autointoxication is destroyed. In the author's experience the most frequent pathologic accompaniment is anemia. This anemia he could not prove to be secondary to the strophulus; on the contrary, his studies led him to the conclusion that the disease was one of the blood, or more particularly of the blood-vessels, in which there was an abnormal reaction of the vessels of the skin, so that the slightest irritation, either from the exterior or from far-removed organs, could produce multiple, localized, inflammatory processes. The essentials of the disease do not lie so much in the character of the irritation as in the abnormally sensitive reaction of the diseased blood-vessels. His therapy consisted in general measures, in elevating the constitutional condition, and in the relief of local disturbance. He obtained greatest success with sulphur and tar for the local conditions, the former employed in the form of baths taken each evening, and the latter by washing with Berger's tar soap. Fifty g. of kali sulphur probalneo were used, and the soap while in the bath. After the bath a 2 to 5 per cent. naphthol salve, and, when eczema existed, boracic or salicylic ointment was rubbed in. Antipyrin in small doses was administered before going to sleep to relieve the itching. The anemia was combated by generous diet, air, and liq. ferri albumin, and the syr. ferri iodat.; change of air and sojourn in the country or at spas he found to exert a very beneficial influence.

Vaccination.—Dr. Herbert Goude¹ reports from the Highgate Small-pox Hospital that in fifty-eight years no nurse or servant in that institution has contracted small-pox even in a modified form, except a gardener who escaped revaccination. All persons coming for duty to the hospital are vaccinated at once, and if no result is at first obtained, revaccination is practised before the person is allowed to go on duty.

Post-vaccinal Dermatositis in Patches simulating Urticaria Pigmentosa.—Darier² records the case of a child two years old who was vaccinated with bovine lymph without careful antiseptic precautions. On the tenth or twelfth day there appeared about one of the pustules a red, squamous infiltrated zone, which gradually increased in size. Later on similar patches developed in large numbers on the trunk and limbs. The patches presented raised borders and the surface was scaling. There was much itching, and at times there was oozing. The lesions resembled those of urticaria pigmentosa, save that desquamation was present and dermatographism absent. Microscopically, the process was a dermatitis without *mastzellen*. The author arrives at the conclusion that the eruption was a chronic eczema, but whether it was to be attributed to predisposition on the part of the patient or to some pathogenic agent inoculated with the vaccine virus the author cannot decide.

[Such cases as the above only serve to impress more thoroughly the vast importance of attention to every detail of antiseptics in performing vaccination; for, although it is true that the irritation of vaccination may often serve to arouse a latent dermatosis, just as an intestinal irritation may, yet

¹ Lancet, July 28, 1894.

² Medical Week, Nov. 23, 1894.

the careless manner in which vaccination is often done makes it very probable that a great many other organisms are introduced beside the vaccine-bacillus.]

Vitiligo, Lichen Ruber Planus, and Chronic Circumscribed Neurodermatitis.—Welander¹ describes a case in which an interesting combination of dermatoses developed after an accident received by the capsizing of a boat. From the time of this accident (August, 1892) the disposition of the patient had entirely changed. From being a good-tempered person he became irritable. This continued for some time, and then he suddenly regained his usual health and disposition. A month after the accident there was noticed upon the back of the left hand spots of vitiligo. This was not accompanied by any itching or other symptoms. Little by little white patches appeared on other parts of the body. A little more than a year after the accident the patient noticed a circumscribed area on the outer surface of the right thigh in which there was very intense pruritus, and soon there developed here small hard papules, which finally formed a rough, somewhat elevated, scaly plaque. There was no history of oozing. This patch slowly extended. Soon little pruriginous papules began to appear on other parts of the body. The patient was treated several times with arsenic, but with little benefit. At the time of the examination by the author the patient was in a very nervous state, but otherwise healthy. Scattered all over the body were intermingled white areas of various shapes and sizes, and also small hyperpigmented spots. On the right thigh was an area as large as the palm in which the skin was white, with here and there dark spots. The skin of this region was thickened, and was divided into lozenge-shaped spaces by little furrows. There was no oozing. On the small of the back and in each popliteal space were similar patches. On the thighs and trunk there were many small pigmented spots, some of them depressed below the level of the skin, and mingled with them small, hard, reddish papules. The author concludes that the patches represent the affection described by Jacquet and Brocq as "*névrodermite chronique circonscrite*." The papules and small pigmented areas are the lesions of lichen ruber planus, while the white patches are due to vitiligo. All of these maladies are to be ascribed to the affection of the nervous system caused by the accident.

Xeroderma Pigmentosum.—Schutte² reports 3 children of the same family who presented xeroderma pigmentosum. The first symptom was dark pigmentation of the face, and this was followed by atrophy with parchment-like skin, and finally the formation of malignant tumors. There was no history of antecedent cases in the family. Two younger sisters showed the initial symptoms of the affection. Treatment produced no improvement.

DeAmicis³ reports the occurrence in 2 brothers, six and four years old,

¹ *Annales de Dermatol. et de Syph.*, June, 1894.

² *Jour. Mal. cutan. et syph.*, Nov., 1893; *Univ. Med. Magazine*, July, 1894.

³ *Berlin. klin. Woch.*, No. 20, 1894; *Med. News*, Sept. 1, 1894.

of xeroderma pigmentosum. There was no hereditary predisposition. The first evidences of the disease developed in the one at the age of eight months, and in the other at the age of one year. The first symptom was the development upon the hands and face of spots, some pigmented and some telangiectatic. The skin became dry, rough, atrophic, and parchment-like. In one child at the age of five there appeared upon the cheeks fungus-like masses, and the same condition was noted in the other at three years of age. In both the epiphyses of the bones of the hands were enlarged. Tissue removed from the fungus-masses showed a structure like tubular epithelioma. No microorganisms could be found. Treatment failed to improve the condition.

SYPHILIS.

Infection of a Mother by a Congenitally Syphilitic Child.—*Countts*¹ reports the following case, which he thinks worthy a place in literature, because, in an experience of 2000 cases of congenital syphilis, he has seen no other case like it. The child had snuffles at the age of three weeks, and a transient rash on the buttocks. There was no history of syphilis either in the mother or father. When examined by the reporter the child was eight months old and presented well-marked congenital syphilis, with lesions of the mucous membranes of the mouth and nose and a rash upon the body. It was impossible to get any history or to detect any evidence of an initial lesion in the baby. In a week after the child's mouth had first got sore there had appeared two small ulcers on the right nipple of the mother. These increased in size and assumed the character of chancres, the upper one especially becoming indurated. The mother gradually developed all the symptoms of syphilis. The author thinks that this could not have been a case of acquired syphilis in the infant, as there was a complete absence of all history of an initial lesion, and the whole course of the malady was that of congenital syphilis. The author remarks that this case has shaken his belief in the absoluteness of Colles's law.

*Ogilvie*² calls attention to the difficulty of distinguishing congenital syphilis from infantile acquired syphilis. He quotes *Fournier* on this point: 1. Certain special symptoms, which were originally considered as signs indicating hereditary syphilis, can be produced by syphilis acquired in infancy; 2. The only two reliable points are found in the previous history of the patient and in the examination of the patient's entire family history.

Zosteriform Eruption in a Syphilitic Patient.—*Jullien*³ records the case of a woman who, in the latter part of the first year of syphilis, was attacked by an erythematous papular eruption which was distributed along the inner side of the left arm and on the side of the left chest, not passing beyond the mid-line. The author notes the fact that *Besnier* has already called attention to the frequency with which zosteriform eruptions occur with

¹ *Lancet*, June 9, 1894.

² *Ibid.*, July 28, 1894.

³ *Medical Week*, Nov. 23, 1894.

syphilis, and agrees with him that the syphilitic virus may act as the nerve-irritant that provokes the eruption.

Pathogeny of Mercurial Inflammations of the Mucosæ.—It has for a long time been noted that accidental stomatitis arising during the mercurial treatment of syphilis does not depend alone on the amount of the drug given, but on the manner of administration, on the condition of the mouth, and on other factors not understood. Maurel¹ offers this explanation: He long ago found that the leukocytes are exceedingly sensitive to the action of mercury, which causes them rapidly to lose their vitality. This led him to think that stomatitis might be due to suspension of the phagocytic action of the white cells in the buccal mucosa. The author found that in rabbits the nasal mucus inoculated into others produced no effect until a dose of mercury exceeding 1 cg. per kgm. was given, when abscesses were produced.

Contagiousness of the Late Mouth-lesions of Syphilis.—Besnier² states that on account of the doubt as to whether the late mouth-lesions of syphilis are contagious he discourages marriage in those syphilitics who will not give up smoking.

Inconveniences of the Various Methods of Mercurial Treatment.—At a meeting of the Society of Physicians of Berlin,³ Fürbringer called attention to the frequency with which syphilitic patients under mercurial treatment develop nephritis. Out of 100 patients, 8 had developed albuminuria in consequence of the absorption of mercury. As Welander had shown, these cases always tended to recovery on the cessation of the drug. The nephritis has been observed to occur under different methods of administration of mercury and with widely different doses. At the same meeting Lewin stated that he always used hypodermic injections of mercuric chlorid, and, though this salt was often given in large doses, he had never seen nephritis following. He believes that nephritis only supervened when insoluble preparations were injected in large doses, because then it was impossible to prevent the absorption of the drug *en masse*.

Electric Mercuric-chlorid Baths in Syphilis.—Ullmann⁴ has found that baths of mercuric chlorid through which an electric current of from 100 to 200 ma. is being passed have a decided effect upon stubborn syphilitic affections. The baths are to be of from thirty to forty minutes' duration.

Resorbin in Syphilis.—Hahn⁵ states that the ointment base known as resorbin is especially valuable as a menstruum for the inunction of mercurial salts in the treatment of syphilis, the symptoms disappearing in an unusually prompt manner.

Treatment of Hereditary Syphilis.—Simon⁶ recommends for infants five or six weeks old 20 minims of Van Swieten's liquid in milk three times a day. At the same time inunctions of Neapolitan ointment, from $\frac{1}{2}$ to 2

¹ Medical Week, July 27, 1894.

² Ibid., July 20, 1894.

³ Ibid., July 13, 1894.

⁴ Ibid., Nov. 9, 1894.

⁵ Monatsh. f. prakt. Derm., Bd. xix., No. 2; Univ. Med. Magazine, Jan., 1895.

⁶ Rev. Internat. de Bib. médicale, July, 1894; Therapeutic Gazette, Oct., 1894.

g. are used morning and evening. Baths of mercuric chlorid are also useful. The child may be placed in the following bath for a quarter of an hour :

Mercuric chlorid,	4 g. ;
Ammonium muriate,	6 g. ;
Water,	2500 g.

Mucous patches should be treated with silver nitrate, iodoform, or calomel. Ulcerations must be bathed with mercuric-chlorid solution. To osseous tumors pieces of Vigo plaster are applied. Separation of the epiphyses of bones should be treated by fixation of the fragments.

Incurable Lesions of Syphilis.—Gowers¹ in a clinical lecture calls attention to the fact that the idea is still very common that all syphilitic disease will yield to treatment. One should not believe this who is familiar with the fact that syphilitic lesions of the skin not infrequently leave scars. In certain organs, as those of the nervous system, this scarring may interfere permanently with the functions of the organ.

Diminished Prevalence of Syphilis.—Musser,² from a study of the cases admitted to the Philadelphia Hospital in the last thirty years, concludes that there has been a progressive diminution in the number of cases, notwithstanding the increase in population ; that syphilis is at present a mild disease ; and that tertiary and visceral manifestations are rare.

Gallate of Mercury in Syphilis.—Cheinisse³ thinks that gallate of mercury is one of the most eligible preparations of mercury. It should be commenced in the dose of 0.05 gram in pill twice a day. This dose may be increased to four pills a day. It does not cause the intestinal troubles of the yellow iodid nor the stomatitis likely to arise during the administration of mercuric chlorid. While giving the drug the mouth should be kept clean.

Treatment of Syphilis by Hypodermic Injections.—Lendin,⁴ after using a large number of hypodermic injections of the salts of mercury, arrives at these conclusions : Calomel is more apt to provoke abscess than the salicylate or the thymolate of mercury ; calomel is better borne when suspended in oil than when given in glycerol. If a case is being treated for the first time, calomel acts more promptly than the other salts, but if it is a relapse, there is no appreciable difference in the action of the three salts. The dose of calomel varied from .05 to 0.2 of a gram. The other preparations were given in doses ranging from 0.05 to 0.1 g.

Jullien,⁵ who is one of the most ardent partisans of the hypodermic treatment of syphilis, thinks that mercury should be administered to people suffering from syphilis as soon as the diagnosis is made. He uses a mixture of calomel in petrolin, and believes that if the rules of antiseptic surgery are carried out there will be no accidents, such as abscesses. In robust persons the author administers 0.10 g. of calomel in 1 cm. of petrolin. The

¹ Brit. Med. Jour., Dec. 1, 1894.

² Medical News, Aug. 11, 1894.

³ Jour. de Méd. de Paris, Nov. 11, 1894 ; Vrach, No. 15, 1894.

⁴ Jour. de Méd. de Paris, Dec. 30, 1894.

⁵ Provincial Med. Jour., Aug. 1, 1894.

injections are preferably given in the hip and shoulder. For the first two months the injections are given every fifteen days; after that the intervals are increased to twenty or thirty days. The dose may also be gradually diminished. Before using this treatment it is necessary to be sure that the kidneys are perfectly sound, and during the treatment the mouth and gums must be carefully attended to.

Wolff¹ has written to a large number of authorities of European celebrity in regard to their views as to the use of hypodermic injections of the mercurial preparations in syphilis. The author draws the following conclusions from the answers which he has received: 1. The method is largely employed in Continental Europe, with perhaps the exception of France; 2. The preparations used are, in the order of their favor, sublimate, calomel, salicylate, yellow oxid, sozoidolate, and gray oil; 3. There is a preference for the soluble preparations; for rapidity of action and permanence of effect calomel seems to hold the first place; 4. The time during which the treatment is continued is not definitely limited, but should be so long as there are symptoms; 5. The bad effects of the treatment are not so frequent or so serious as has been represented, and are more common from the insoluble than from the soluble preparations.

From a study of a number of cases Horwitz² arrives at the following conclusions as to the treatment of syphilis by the hypodermic administration of mercuric chlorid and gray oil: 1. Hypodermic medication will not abort syphilis; 2. This method of treatment should not be employed as a routine method; 3. The production of abscesses or pytalism is rare; 4. Injections of mercuric chlorid give rise to little pain and no callosities; 5. The gray oil gives rise to some pain and induration; 6. The gray oil is more dangerous than the mercuric chlorid; 7. If a case has not been treated with mercury previously, a quarter of a grain of mercuric chlorid should be given at a dose; if the patient has been treated, a sixth of a grain; 8. Hypodermic injections are of the greatest importance when a rapid effect is desired, as in lesions upon the face or when some vital organ is involved; when time is an object in the treatment; in relapsing syphilis when other methods have failed; in nervous syphilis; in those eruptions that are rebellious to ordinary treatment.

Traumaticin with Calomel in the Treatment of Syphilis.—Cauchard³ describes very favorable results obtained by pencillings with traumaticin containing 25 per cent. of calomel. The applications were made three times a week to those points where the syphilitic manifestations were particularly grave. This method combines the advantages of both local and general treatment, and is of special value in those who are weak and bear internal administration of mercury badly, in cases of hereditary syphilis, and in tardy cutaneous syphilides.

The Intravenous Injection of Mercuric Chlorid in Syphilis.—Blaschko⁴

¹ Therap. Gaz., May 15, 1894.

² Ibid.

³ Jour. de Méd. de Paris, Oct. 28, 1894.

⁴ Berlin. klin. Woch., Nov., 1894.

gives some account of his experience with Baccelli's method of administering mercuric chlorid by intravenous injection. Baccelli at first injects 1 cm. of a 1 per cent. solution each day, and later on increases the dose even to such a quantity as shall contain 8 milligrams; when the latter dose is given a 2 per cent. solution is used, so that the amount of the fluid may not be so large. The author makes use of the following solution:

R. Mercuric chlorid,	0.3 g.
Sodium chlorid,	0.6 g.
Water, enough to make	100 c.c.

Of this he first uses a syringe, holding 2 c.cm., one-quarter full, and later injects the whole syringe-full, and sometimes twice this amount. According to Blaschko, the advantages of the method are: 1. The painlessness of the operation; 2. The trifling amount of mercury with which a cure is effected; 3. The exact dosage; 4. The fact that the whole mass of the drug given is active; 5. The absence of unpleasant symptoms and intoxication. The author thinks that one of the most important things accomplished by Baccelli is to show how little of a drug will prove efficient if it is given in such a way that all of the dose becomes effective.

Pyle¹ reviews the Italian opinion in regard to the intravenous use of mercury. The advantages claimed for the method are: 1. There is absolute certainty of absorption; 2. There is no pain to speak of; 3. There is no disturbance of the digestive tract; 4. There is more rapid therapeutic effect than by any other method; 5. Less of the salt is required; 6. Absolute exactitude of dosage can be obtained; 7. It seems safe, not one accident having been reported; 8. It is very reliable, all cases having shown improvement; 9. Abscesses are absent; 10. There is no dermal irritation, such as follows inunction; 11. The hysteric symptoms which have been remarked with the usual hypodermic method are absent; 12. It is successful when other methods have failed; 13. There is no history of recurrence after a cure; 14. Mercuric chlorid has a preservative action on the red corpuscles, and should be of advantage in a disease like syphilis in which there is a tendency to anemia.

The disadvantages urged against the method are: 1. The needle may not enter the veins, but this can be remedied by introducing the needle before the syringe is attached and seeing the blood come out of it; 2. Some blood may extravasate into the subcutaneous tissue, but this is of no significance; 3. There is likely to be a slight stomatitis at first; 4. There is albumin in the urine after the injections; 5. There is a polyuria; 6. Fainting may occur during the injection; 7. Salivation has been noticed immediately after the use of small doses.

Lewin² makes some exhaustive comparisons of his method of subcu-

¹ Medical News, Feb. 23, 1895.

² Berlin. klin. Woch., No. 12, 1895.

taneous injections of mercuric chlorid with the methods of inunction and the insoluble mercurial injections. He studies the question with respect to the relationship each bears to the production of untoward symptoms—namely, (1) Stomatitis, which he shows occurred in a very large percentage treated by the other methods. In the injections of mercuric chlorid this was never seen in a severe form. He thinks he has avoided this by painting the gums with silver nitrate the moment swelling occurred, and by lessening the dose or interrupting the treatment completely for a few days. (2) Enteritis, which is reported to have occurred in a considerable number of cases treated by the other methods, amounted to only a tendency to diarrhea, particularly in summer, in those treated by his method. (3) Nephritis he also never met with, though it is reported to have occurred with other methods. (4) Embolism, while of course it cannot occur by inunctions, is reported to have occurred, particularly in the lungs, by the use of insoluble salts of mercury. It had never been observed in his cases. (5) Diseases of the nervous system or alterations in the psychic, sensitive, and motor spheres are common accompaniments of the mercurial treatment, but these also were not observed. (6) Local disturbance or pain of course depends, in great measure, upon the sensitiveness of the individual and the carefulness and deftness of the operator. Insoluble preparations produce, in spite of all precautions, great pain. This he met with in limited degree, and only occasionally had to resort to other means because of it. (7) Abscesses have been seen by nearly every one who has employed insoluble salts, and with inunctions, though rare, it has occurred. By Lewin's method, though he made 24,000 injections in 800 patients, not one developed an abscess, and yet only the ordinary antiseptic precautions were taken. (8) Exanthemata may occur by injections of both insoluble and soluble salts, though these are never of a menacing character. With the inunction method, on the contrary, it is by no means uncommon to see very severe eruptions, sometimes forms of malignant mercurial eruption. (9) Though injections of the soluble salts must be given more frequently, they are less dangerous than the insoluble preparations, which may be absorbed *en masse*. (10) Every mercurial cure is subject to many circumstances requiring its interruption, and here the mercuric chlorid injections certainly have the advantage in that when they are stopped all stops, and the patient is not endangered. (11) In cases demanding rapid and decisive action the mercuric chlorid injection again recommends itself, for here as high as three injections a day of 0.012 g. of a solution that is rapidly absorbed can be given, and should complications occur they can readily be kept under by reducing the number of injections. (12) As regards the length of time of the treatment, while it is claimed that it is shortened by the insoluble injections, the opposite is most frequently the case. (13) Recurrences happen by any mode of treatment, yet it is Lewin's experience that more malignant recurrences are to be seen following upon the insoluble solutions and inunctions than upon the mercuric chlorid injections. (14) Lewin has never met with a case of death nor has one been reported, to his know-

ledge, by his method, while by the injection of insoluble preparations of mercury, 15 are now reported.

Modifications called for in the Treatment of Syphilis.—Abadie¹ thinks that in view of the incurable troubles that may follow soon after the primary lesion of syphilis, one cannot begin the treatment too soon after a diagnosis of chancre has been made. The best form of treatment is the hypodermic administration. Should the gravity of the symptoms not be rapidly modified, intravenous administration should be resorted to. In the discussion which followed these remarks Morel-Lavallée stated that in his estimation the pill of protoiodid and the potassium iodid were more powerful than seemed to be thought by some to-day. Hallopeau had no doubt that the hypodermic method was one of the most energetic methods of treating syphilis, but the method cannot be used in all cases. Barthelémy stated that intravenous injections were not entirely safe, as in 11 cases Chantemesse had seen phlebitis develop in 1. Ehlers did not believe that hypodermic injections could be much used, on account of the pain.

Thyroid Extract in Syphilis.—Menziès² reports 4 cases of malignant syphilis which he treated by thyroid extract, no other remedy being used. There was an improvement noted in all the cases. From his experience the author concludes that the remedy is a powerful skin-tonic and a useful adjuvant to mercury and potassium in the treatment of syphilis.

Alleged Exceptions to Colles's Law.—Parker³ states that in ten years in the out-patient department of the Children's Hospital at Shadwell he has not observed a single reliable case of infection by a congenitally syphilitic child. The author thinks that inherited syphilis may have changed its type since Colles laid down his law, and this may account for the fact that so few exceptions to this law are found.

Syphilitic Reinfection.—Budugoff-Budugian⁴ reports a case of reinfection with syphilis. A man forty-one years of age was seen in November, 1893, with a chancre, who in a short time developed a roseola. The patient had had in 1868 a hard chancre, followed by sore throat and a roseola. He was put on anti-syphilitic treatment, but in 1875 developed a neuroretinitis which was cured by mercurial inunctions. In 1882 he was treated for severe headache with insomnia, and in 1887 he had an iridectomy performed. Since that time he had remained well till his present trouble.

Destructive Folliculitis of the Scalp in a Patient with Hereditary Syphilis.—Payne⁵ thinks that the bacillus regarded by Quinquaud as the cause of folliculitis decalvans is not the sole cause. He reports the case of a cachectic girl of fourteen who presented herself with a disease of the scalp which had lasted six or seven years. The affection consisted of a suppurative trouble of the hair-bulbs, with some diffuse inflammation producing

¹ Medical Week, May 3, 1895.

² Brit. Med. Jour., July 7, 1894.

³ Ibid., Feb. 9, 1895.

⁴ Vratich, No. 13, 1894; Prov. Med. Jour., June 1, 1894.

⁵ Brit. Jour. Dermatol., April, 1895.

crusts and scales. A large number of the hair-bulbs were destroyed, causing a large oval area of baldness, with glossy atrophic skin, over the vertex. The hair at the back and sides of the head and at the forehead was little affected, but showed some suppurating bulbs. On the ears and cheeks was an eruption like ordinary eczema. There was a chronic inflammation of both eyelids and of the margin of one nostril. The lymph-ganglia of the neck, under the jaw, at the sides of the cheeks, and in front of the ear were enlarged and hard, but none of them had suppurated. There was evidence of hereditary syphilis, and the child was put on constitutional treatment and recovered. No local treatment had accomplished anything till the general treatment was begun.

Elephantiasis associated with Tertiary Syphilis.—Francis¹ believes that enough attention has not been directed to the frequency with which elephantiasis occurs in the later stages of syphilis. Syphilis is indeed one of the commoner causes of elephantiasis in our climate. The author records 7 cases of this sort that have come under his notice. The elephantiasis does not attain such enormous proportions as may be seen in the tropical forms of the disease. In this form of the malady it is not uncommon to notice the elephantoid fever. The disease is most common in the lower extremities and about the genitals. The author thinks that the cause of this condition is endolymphangitis of syphilitic origin.

Serotherapy in Syphilis.—MM. Hericourt and Richet² have used dog-serum with some success in the treatment of syphilis. One case was that of a woman with tertiary syphilis who was suffering from nocturnal pains. After other treatment had failed, three injections of serum, 6 c.c. each, produced improvement. Another case was that of a young woman who had had syphilis for three years. She had many large ulcers. Under the serum-treatment the ulcers were nearly healed in eight days.

Rubidium Iodid in Syphilis.—Leistikoff³ proposes to replace potassium iodid in the treatment of syphilis by the rubidium iodid. The taste of this drug is not so disagreeable as that of the potassium salt, and iodism is not so readily produced. The dose is that of potassium iodid.

Multiple Chancres following Tattooing.—Cheinisse⁴ reports the case of a young blacksmith who had the emblems of his trade tattooed upon his right forearm. At the end of forty days small red, scaly elevations appeared at five different points in the tattooed area. These broke down to form ulcers. When examined these ulcers presented the peculiarities of chancres, and there was upon the body of the patient a well-marked syphilitic roseola. It was ascertained that during the tattooing the operator had moistened the ink with his own saliva.

Icterus in the Early Stages of Syphilis.—Joseph⁵ reports 3 cases of

¹ Brit. Jour. Dermatol., Aug., 1894.

² Lancet, Jan. 26, 1895.

³ Jour. de Méd. de Paris, April 22, 1894.

⁴ Annales de Dermatol. et de Syph., Jan., 1895.

⁵ Arch. f. Dermatol. u. Syph., Band xxix. Heft 3.

icterus occurring in syphilitic subjects. The cases were remarkable in that the icterus occurred either at the time of the first skin-eruption or at the time of the recurrences. The symptoms were essentially those of the ordinary icterus catarrhalis—the discoloration of the skin and conjunctivæ, pasty stools, bile-coloring matters in the urine, vertigo, headache, nausea, etc. The liver was also appreciably enlarged. Unlike the ordinary icterus, this was made to disappear very rapidly. Ordinary methods produced but slight effect upon it, but mercury caused a rapid disappearance. These facts led him to the conclusion that the icterus stood in etiologic relationship to the syphilis. Many theories have been advanced as to the origin of this icterus. Joseph believes that of Mauriac explains the symptomatology best. Mauriac regards the icterus syphiliticus as an acute diffuse interstitial hepatitis, with probably some inflammation of the parenchyma produced by the toxic action of the specific virus.

The Effect of Mercury upon Temporarily Latent Syphilis.—Watraszewski¹ believes that many of the recurrences of syphilis seen in cases that have run their habitual course and have been apparently successfully treated are due to the mercury acting as an excitant to the quiescent virus. He attributes the formation of gummata and specific ulcers following upon blows or bruises in old syphilitics to the custom of treating syphilis preventively. Such a method is not to be regarded as indifferent to the organism, especially the nervous system. It is not uncommon to see neurasthenia, nervous excitation, or depression associated with syphilis, and these conditions made manifestly worse by the continuance of the mercurial. Cases are frequently reported in which during the course of an energetic treatment a new eruption occurs. It is also a fact that workmen employed in places where they may acquire chronic mercurialism are not immune to syphilis. From these data the author thinks that in general the only time to employ mercury is when specific symptoms are present, otherwise we ruin the nervous system of the patient, or, worse, furnish the virus with a new incentive to further inroads.

Syphilis of the Parotid and Sublingual Glands.—Neumann² in a series of 6 cases of syphilitic affections of the salivary glands reports 5 affecting the parotids on both sides: 4 of these were in females and 1 in a male. A sixth case was an affection of the right sublingual and the aggregation of acinous glands near the middle line and apex of the tongue, known as the glands of Blandin and Nuhn. The diagnosis of a specific affection of one or the other of these glands, when no other lesions or scars of previous lesions exist, is a difficult one. Syphilis of the parotid can possibly be differentiated from other affections by the presence of other syphilitic lesions, the lingering course of the affection, the very slight painfulness, and the absence of any tendency to suppuration, and the consistency of the gland. Affections of these glands are comparatively rare, but the marked functional

¹ Arch. f. Dermatol. u. Syph., Band xxix. Heft 1.

² Ibid.

disturbances which they may produce makes it of importance to keep them in mind.

PATHOLOGY.

The Bacteriologic Diagnosis of Acne.—Hodara¹ adopts Unna's understanding that acne is that form of follicular inflammation that is seen upon the forehead, cheeks, nose, chin, shoulders, chest, and arms of young people which is always associated with comedones and often becomes pustular. A folliculitis without comedones is not acne. A comedo has in vertical section a conical shape, the lower part being wider than the upper. Its outer part consists of concentrically placed corneous tissue, while the body is composed of horny plates with hollow spaces between them. In comedones three sorts of microorganisms are found: (1) A form of coccus peculiar to the comedo; (2) A large bacillus, the flask-shaped bacillus of Unna; (3) Small bacilli. The third variety of organism is not found in comedones unconnected with acne, and it seems that this parasite is the cause of the acne.

Erythema Nodosum.—Schulthess² from a study of 113 cases of erythema nodosum draws these conclusions: 1. Erythema nodosum represents an infectious disease sui generis; 2. It has more in common with purpura rheumatica than with erythema multiforme; 3. It is highly improbable that it has anything to do with acute rheumatism; 4. Damp dwellings seem to play some part in the etiology of the affection; 5. It is possible that a very rapid growth in young persons plays also a part in the causation.

The Demodex Folliculorum in the Mange of Dogs.—Thudichum³ has found in a very severe case of mange in a dog the ordinary demodex folliculorum, such as is found in the sebaceous follicles of man. Gruby has shown that the parasite can be transferred from man to the dog, and in a case thus inoculated the animal lost all its hair in the course of two years. It is probable that the parasite may also be conveyed from the dog to man. In man, as a rule, no disturbance is caused by the presence of the demodex except that there is usually a seborrhea, but sometimes suppuration sets up with the formation of acne-pimples. In both the dog and man the author thinks that sulphur ointment is the best remedy. In the dog especially treatment must be kept up for a long time after apparent recovery, as there is a tendency to relapse.

Yaws in Borneo not connected with Syphilis.—Surgeon-captain F. Smith⁴ has observed in North Borneo certain cases of yaws which he thinks go to prove the absence of all connection between this disease and syphilis. The cases occurred in a family far removed from ready intercourse with others. Two children presented lesions which looked like condylomata, some covered with crusts and others ulcerating. Another child had recently recovered, and presented scars, though his health seemed good. There was no evidence that either of the parents had ever had syphilis, nor did any of

¹ Monats. f. prakt. Dermatol., xviii. 1894; Am. Med.-Surg. Bull., Oct. 15, 1894.

² Correspondenz-Blatt f. Schw. Aerzte, Sept. 1, 1894.

³ Med. Press and Circular, Aug. 1, 1894.

⁴ Lancet, Oct. 20, 1894.

the children present any lesions which might have been construed as syphilitic beside the skin-eruption. The author does not think it likely that hereditary syphilis would have presented exactly the same appearance in two children at the same time. Syphilis so severe as the lesions presented would indicate would produce profound constitutional disturbance, but these children seemed quite well save for the skin-eruption.

Masked and Latent Glanders.—Dr. V. Babes,¹ by means of a substance isolated from growths of glanders bacilli in a manner similar to that in which tuberculin is prepared, has been able to make some interesting observations concerning a form of glanders till now not recognized. The name “mallein” has been given to this substance. Introduced into animals affected with glanders, it determines a reaction like that caused by tuberculin in tuberculous animals. In experimenting with mallein it was noticed that in some horses, which were apparently entirely healthy, a reaction was caused. In these cases postmortem there were found small nodules in various organs surrounded by very dense capsules. Although in these nodules glanders-bacilli have not been demonstrated, yet cultures made from them and inoculated into guinea-pigs have caused glanders. The unsuspected frequency with which this latent form of glanders was found in the horse suggests how it is that in men who have not for a long time been about horses or in any other way exposed to glanders the disease may suddenly appear in an acute form. These persons have been carrying around with them, perhaps for years, nodules containing quiescent bacilli; under some unusual hardship, as a removal to a colder climate, physiologic resistance is reduced and the bacilli multiply.

[Such observations, aside from their intrinsic importance, are of much interest, because whenever points previously obscure in the etiology of infectious diseases are elucidated by a study of the natural history of the bacterium supposed to be the cause of the disease, the germ-theory of disease is strengthened.]

The Protozoa-like Bodies of Herpes Zoster.—Hartzell² describes certain bodies occurring in the vesicles of herpes zoster which have been regarded as protozoa. Of these there are three forms. The first variety consists of a double-contoured wall with one or two nuclei in the center. Such cells often occur in pairs. The second variety is less numerous than the first; the cells are very large, consisting of a cell-body surrounding a thick internal wall which encloses a cavity containing from three to a dozen or more round or oval cells. With a high power the small cells in the cavity are seen to stain rose-red with Biondi's fluid. The bodies of the third variety are very large and pear-shaped, with the same general arrangement as those just described. They resemble the epithelial cells containing coccidia found in the bile-ducts of rabbits suffering from psorospermiosis of the liver. The author narrates a case of recurrent zoster in the course of the sciatic nerve which was of traumatic origin. In the vesicles in this case the

¹ Medical Week, Sept. 14, 1894.

² Jour. Cutan. and Genito-urin. Dis., Sept., 1894.

bodies described were found, and from this fact the author concludes that these cells are not coccidia, but altered epithelial cells.

Malarial Origin of Herpes Zoster.—Winfield¹ reports 8 cases of herpes zoster, in 4 of which the parasites of Laveran, sometimes the intracellular form, sometimes the mulberry or the flagellate variety, were found in the blood. The author thinks from this that malaria should stand in the forefront as a cause of zoster. He draws attention to the frequency with which facial herpes complicates malarial intermittent fever, and suggests that this may have a similar origin.

[In following the literature of malaria one is struck by the great number of different forms in which the parasite of the disease manifests itself. It seems not unlikely that there may be various parasites found in the blood, some of which really have no etiologic connection with malaria. It seems to us that before we are in a position to affirm that diseases in which a parasite can be demonstrated in the blood are to be regarded as necessarily of malarial origin, the real malarial parasite should be more accurately defined than it is at present.]

Lichen Pilaris and Ichthyosis.—Meneau² thinks that there is a close relationship between lichen pilaris and ichthyosis, and bases his belief on the fact that in almost all of those affected with the latter disease the lesions of lichen pilaris are found, while those who suffer from the former malady present to a certain extent the induration of the palm which is so frequently noticed with ichthyosis. The author thinks that lichen pilaris may be regarded as an attenuated form of ichthyosis localized in the hair-follicle and having the character of an evolutive disease, which is absent in ichthyosis.

The Contagiousness of Molluscum Contagiosum.—Stelwagon³ thinks that there are enough facts on record to warrant the conclusion that molluscum contagiosum is a contagious disease. The fact that contagion is often difficult to trace does not prove anything, as the same is often true of so contagious a disease as ring-worm. The inoculation failures are not to be regarded as negative evidence, but, on the other hand, one success will outweigh many failures. The author groups his evidence under the following heads: (1) Clinical examples of communicability from one to several members of a household and from family to family; (2) clinical examples of its spread in asylums, schools, hospitals, etc.; (3) examples of accidental inoculation [the author records under this head instances in which a number of medical men have been accidentally inoculated from their patients]; (4) successful experimental inoculation. Seven successful attempts are recorded. In all, the long time of incubation (from one to six months) is a very noticeable feature and may account for some of the failures.

The Etiology of Pemphigus Vulgaris.—An exhaustive study of a few cases of pemphigus vulgaris leads Du Mesnil⁴ to the conclusion that pem-

¹ N. Y. Med. Jour., April 6, 1895.

² Medical Week, June 22, 1894.

³ Jour. Cutan. and Genito-urin. Dis., Feb., 1895.

⁴ Arch. f. Dermatol. u. Syph., Bd. xxx. Heft 2.

phigus has its origin in some functional disease of the nervous system. He is not yet prepared to pronounce it either a *vasoneurosis* or a *trophoneurosis*, but his studies teach him that hysterics and those individuals whose nervous systems have suffered from chronic alcohol- or other poisoning form a very large contingent of pemphigus patients. In one case he was able by verbal suggestion alone, without any irritation of the skin, to produce a characteristic bullous eruption. In another case a pemphigoid eruption of the entire body followed upon the great shock consequent upon the death of a husband by apoplexy.

Scabies and its Accidental Complications.—Leloir¹ states that although the acarus never quits its abode in the skin, except the young who may go to find a place on another part of the body, it is much more active at night than in the day. This is not alone due to the warmth of the bed, since an acarus placed on a cloth lies perfectly still in the day, but moves actively at night. The acarus is very tenacious of life, being able to live seven days in cold and ten in warm water. The burrow excavated in the skin by the female, with occasionally a small vesicle at the end of the burrow, is the only true lesion of scabies. But, due to the irritation and secondary inoculation, various dermatoses may arise resembling eczema, ecthyma, impetigo, follicular inflammations, etc. Scabies may be abnormal on account of the great intensity of the reaction of the skin, or, on the other hand, on account of its extreme mildness. The acarus of the horse and cow sometimes attacks those attending the animals, but this form of scabies usually terminates in a few weeks of itself, since the mites do not burrow deeply in the skin. Leloir has seen a case in which, on account of improper treatment, scabies had persisted for ten years. There are countries where the children come into the world with scabies and go to their graves still bearing it.

Multiple Hemorrhagic Idiopathic Sarcoma.—Kaposi² refers to the affection which is usually known by the name sarcoma idiopathicum multiplex pigmentosum. This growth commences on the backs of the hands and feet as infiltrations of a reddish color and hard consistency. Histologically, the tumors are made up of round or fusiform cells closely resembling the arrangement of sarcomas, and thus deserve to be placed under this category. The term pigmentosum used in the name is a misnomer, as the pigmentation is only an accidental feature arising from small hemorrhages entering into the tumor. Kaposi suggests that the name sarcoma idiopathicum multiplex hæmorrhagicum would be more appropriate.

Pathogeny of Scleroderma.—Singer³ reports a case of scleroderma in which postmortem he found marked decrease in the size of the right lobe of the thyroid and calcified nodules in both lobes. The author thinks that scleroderma is somewhat analogous to myxedema, and points to the fact that in some cases of exophthalmic goiter myxedema is also present, while in

¹ Jour. des Mal. cutan. et syph., July, 1894.

² Medical Week, April 20, 1894.

³ Ibid., Nov. 9, 1894.

others scleroderma is found. Beer¹ refers to four cases of scleroderma, in all of which decrease in size of the thyroid body was found.

Eruption following the Use of Oil of Sandal-wood.—Morton² reports the case of a young man to whom 20 drops of oil of sandal-wood were given three or four times a day; after three weeks an eruption appeared upon the trunk and lower limbs. The eruption was symmetric, and was more abundant on the back of the body than the front. The lesions consisted of dark-red erythematous spots, many of them purpuric, mostly of the diameter of a split pea. In some places they had coalesced to form large areas of a deep crimson hue. The lesions were but little elevated and were quite smooth. There were no subjective symptoms. The drug was stopped, and in a few days the rash had disappeared, without desquamation and with little pigmentation. The author states that he has made a careful survey of the literature, and finds that a rash from the ingestion of sandal-wood is very rare, and such rashes usually take the form of an urticaria.

Dermatitis Periocularis Medicamentosa.—Fridenberg³ records a case of dermatitis of the eyelids and cheek of an erysipelatous character following the use of atropin as a mydriatic.

Tumors of the Skin.—The histologic investigations of Jarisch⁴ upon 3 cases of peculiar new growths of the skin, which have in the past few years been observed and studied under the various names—hydradénoms éruptif (Besnier), syringocystadenoma (Unna, Török), adenoma of the sweat-glands (Perry), lymphangioma tuberosum multiplex (Hebra, Kaposi), etc., show very clearly that these variously described new growths have no relations either to the sweat-glands or embryonal tissues. They take their origin in a growth of the endothelium of the capillary vessels, possibly in the lymphatics, and hence are properly hemangioendotheliomata or lymphangioendotheliomata. Inasmuch as their clinical aspect is the same as the lymphangioma tuberosum multiplex of Kaposi, he proposes the name multiple tuberosus hemangioendotheliomata. The cases described by Brooks under the name epithelioma adenoides cysticum he found to have nothing in common with the hemangioendotheliomata; on the contrary, they were epitheliomata. The epithelial cell-growth had its origin in the follicles of lanugo hairs. In consequence of such an origin he proposes the name "trichoeptitheliomata," and, with reference to the clinical characteristics, "trichoeptitheliomata papulosum multiplex."

Puberty plays a very prominent part in the development of these tumors. Further investigations upon a third case seem to show that the so-called "colloid degeneration of the skin," which in all probability is identical with the "colloid-milium" of Wagner, is not a colloid degeneration of the connective tissue, but of the elastic fibers. Such a degeneration is identical with the degeneration of elastic fibers which Schmidt has pointed out as being due

¹ Medical Week, Nov. 9, 1894.

² British Jour. of Dermatol., June, 1894.

³ N. Y. med. Monatsschr., vii. 1894.

⁴ Arch. f. Dermatol. u. Syph., Band xxviii. Heft 2 u. 3.

to senile changes, and which Reizenstein has lately found in young individuals.

HISTOLOGIC AND BACTERIOLOGIC.

The Plasma-cell.—Marshalsko,¹ in a study of the peculiar form of cells which Unna claims to have discovered by the use of old reddish-tinged methyl-blue, by over-staining and clarifying with kreosol, and which he claims to be descendants of the fixed connective tissues, thinks he has thoroughly disproven this opinion. He regards these cells as derivatives or descendants of the lymphocytes. He further believes the cell-elements of granulation tissue, improperly called round cells, to be in great part derivatives or descendants of the lymphocytes. Whether leukocytes really possess the power to transform themselves into connective tissue, and thus form a permanent tissue, he is not yet in a position to state.

The Function of the Sweat-glands in Man.—Unna² has somewhat changed his views in regard to the function of the sweat-glands. At one time he held the radical opinion of Meissner that only fat was formed in the sweat-coil, the watery portion of the sweat coming from the papillary layer of the skin. Unna now adopts the view of Henle that during ordinary secretion the sweat coming from the glands is made up largely of specific secretory elements, but that under the influence of appropriate stimuli a watery fluid is formed which is very poor in specific elements.

The Disposition and Function of the Elastic Fibers of the Skin.—According to Nekam,³ the function of the elastic fibers of the skin has been entirely misinterpreted. Instead of giving elasticity to the skin, they rather prevent it from stretching too much, and may be thus called the ligaments of the skin. In those parts where the skin is most movable, as on the penis, there are but few of these fibers, while in parts which are firmly bound down the fibers are numerous. The elastic fibers bind the subcutaneous tissue to the deeper parts, the skin to the subcutaneous tissue, and the epidermis to the skin.

Histology of Epidemic Dermatitis.—Echevarria⁴ believes he has found in the skin-disease described by Savill certain microscopic findings which are pathognomonic. The most important changes are found in the prickle-cells. In the lower strata of this layer the nuclei are hypertrophied, and by pressure from the papillæ they are more or less spindle-shaped, but their substance is not modified, as is shown by the fact that they stain in the normal way. In the upper strata, if the preparation is stained with hematoxylin or carmin dyes, the nucleus seems to be shrunken and surrounded by a clear space. If the preparation be stained with saffranin or methylene-blue, we find that the apparently clear space is in fact a solid body staining poorly, due to a degeneration of the nuclear body. This degeneration is not a hya-

¹ Arch. f. Dermatol. u. Syph., Bd. xxx. Heft 1 u. 2.

² Brit. Jour. of Dermatol., Sept., 1894.

³ Annales de Dermatol. et de Syph., Feb., 1895.

⁴ Brit. Jour. of Dermatol., Jan., 1895.

line degeneration, as is shown by its staining reaction, and the author proposes for it the name "peridiaphanic degeneration."

Microscopic Technique in Dermatology.—Liedermann¹ sums up the advances that have been made in the microscopic technique as applied to dermatology in the past few years as follows:

EPIDERMIS.—The fibrillary structure of the horny cells is best studied from the hair. The hair should be laid in ammonia until the cells fall to pieces. This is best detected by shaking the phial. Examine it in water or dilute calcium-chlorid solution. After thoroughly washing and teasing the preparation, the addition of a little acetic acid clears it up well, or gold chlorid can be added, but shrinkage occurs and a precipitate forms.

AFFINITY OF NUCLEUS AND CELL-BODY FOR STAINS.—It is well known that if cell-structures are brought into a mixture of two anilin stains, the nucleus invariably takes up one, and the cell-body the other. The difference between is because the cell-body is made up of pure albumin, while the nucleus contains an acid-nuclein in the form of nucleoprotein. The nucleus can, however, according to the physiologic activities and character of the nutritive substances, be rich or poor in albumin or entirely free from it. Chemically, the nuclein of the nucleus always chooses the basic stains, while the albumin of the cell-body takes up the acid ones.

CONNECTIVE TISSUE, PLASMA, OR "MASTZELLEN."—Loewenthal recommends the following procedures for rapid study of these cells: A young white rat is killed by chloroform. The connective and adipose tissue is exposed between the shoulder-blades and small pieces cut out. These pieces are placed immediately in the following fluid: Potassium bichromate, $2\frac{1}{2}$ per cent., 4 parts; superosmic acid, 1 per cent., 1 part—where it is allowed to stay twenty-four hours. The pieces are then washed thoroughly in distilled water and placed from thirty-six to forty-eight hours in 70 per cent. alcohol. Before demonstrating, a number of lamellæ, as thin as possible, are loosened from the adipose tissue (which is discarded) and placed in distilled water. These lamellæ are then stained for from three to five minutes in hematoxylin (Delafield's), carefully washed out, and studied in glycerol.

PARASITES OF CARCINOMA.—Many methods have lately been described by which the protozoon-like bodies of carcinoma could be stained. Ruffer and Plummer describe many methods, but the following is to be recommended: (1) Fix in chromic-acid spirit, and remove the specimen to a saturated iron-alum solution at a temperature of 38° C. for twelve hours; dehydrate, over-stain with hematoxylin, decolorize in HCl, 1:500, transfer to a saturated solution of lithium carbonate, stain in a watery solution of cochineal. The nuclei appear blue, the parasites brownish-red. The parasites show a distinct radial striping.

DARIER'S DISEASE.—The "round bodies" and "grains" which by specific methods of staining were brought out in this disease, and classed by Darier as psorosperms, are thought by Petersen to be forms of degeneration

¹ Arch. f. Dermatol. u. Syph., Bd. xxxi. Heft I u. 2.

of the epithelial cells. He obtained his best pictures by staining with picrocarmin and hematoxylin. The latter was used in weak solution and the preparations over-stained. They were then removed for from one-half to two minutes to a solution of the ferric sulph. oxidatum, and then decolorized in HCl-alcohol.

Darier succeeded by the following method in staining parasites in Paget's disease, which he regards as characteristic of it and classifies with the "sporo-zoon." A section of the diseased skin was fixed and hardened in Müller's fluid, another in Flemming's. The former was stained by picrocarmin or alume-carmin and mounted in glycerol, the latter stained with safranin and mounted in balsam.

MOLLUSCUM CONTAGIOSUM.—Campana's experience teaches him that hardened preparations are not suitable for the study of the molluscum parasite. He found that in the study of fresh material he obtained exactly identical pictures with the gregarinosis of rabbits; that is, numerous round structures encapsuled with pearl-like contents. Sometimes these bodies showed a double contour, with small irregularly round bodies in their interior. He was not able, however, to decide whether this alteration was a true gregarinosis. Kromayer regards the whole process as a degeneration of the cells. He holds that the cells undergo a granular degeneration. The granular contents become massed into clumps of lesser and greater size, and thus by the union of several of them the molluscum corpuscles are formed. This is contrary to Neisser's views, in that he holds that the granular mass is the product of the parasite, through whose growth and development the nucleus is pushed aside.

FAVUS.—Neebe and Unna have studied the favus fungus by cutting the agar-cultures into pieces of 1 cm. and hardening in absolute alcohol, then imbedding in celloidin, and cutting sections as in any other tissue-preparations. The sections were freed of celloidin by laying them in a mixture of alcohol and ether, then in absolute alcohol. The sections were then removed to the slide and allowed to dry, care being taken not to let them become too dry. They were stained by Weigert's fibrin-stain method, which Calhoun found gives better results than Unna's chromic method. The fungus-elements appear of a bluish-violet color. The agar is completely decolorized. Potato-cultures were hardened and imbedded in the same manner, but because of the affinity which iodine has for starch the Weigert method could not be employed.

BACTERIA.—Johne employs and recommends as most useful methods for staining bacteria the following: (1) Staining bacteria on cover-glasses,—watery solutions of anilin colors (best employed for anthrax and pathogenic bacteria); (2) Staining bacteria in tissue-sections,—the same as the preceding for same bacteria; (3) Staining bacteria in tissue-sections by the Gram-Günther method, either (a) without previous staining; (b) use of contrast-stain afterward; (c) use of contrast-stain before (not suitable for typhoid, malignant edema, septicemia, or glanders); (4) Stain bacteria in cover-glass

preparations by Gram's method; (5) (a) Stain tubercle-bacillus in cover-glass preparations by Ziehl-Gabbet method, (b) or by Koch-Ehrlich method; (c) Stain tubercle-bacillus in tissue-sections by Koch-Ehrlich method; (6) Bacteria in sections, best use Weigert's fibrin method; (7) Stain glanders bacillus (a) in cover-glass preparations, use Loeffler's (old and new method); (b) in tissue-sections: (1) Loeffler or (2) Noniewicz; (9) Stain tissue-sections with Bismarck-brown or Loeffler's alkaline methylene-blue; (10) Double staining of tissue-sections with hematoxylin and picric acid or eosin (only suitable for sections with actinomycosis or when wishing to bring out the structure of tissue).

Dávalos recommends as a universal stain for all bacteria the following modified Ziehl's: Fuchsin 0.25, alcohol 10.0, crystallized phenol 5.0, water 100.0. Filter the solution. Leave cover-glass in from one to two minutes, wash off, and mount in balsam.

Nicolle obtains good results for all bacteria that take up methylene-blue, especially in sections containing glanders, typhoid, hog-cholera, the coccobacillary pseudotuberculosis, chicken-cholera, and the bacillus found in soft chancre. Stain in Loeffler's or Kühne's blue from one to three minutes, wash off in water, treat with solution of tannic acid from 1:10 for a moment, wash off in water, dehydrate in absolute alcohol, clear up in clove or bergamot oil, xylol, and mount in xylol balsam.

SYPHILIS.—Sabouraud in 51 preparations stained by Lustgarten's method could not find the bacillus described by Lustgarten. This method he finds particularly good for tubercle. Currier arrived at the same results. A certain method for demonstrating the bacillus of syphilis must yet be discovered.

SOFT CHANCRE.—Petersen found in the pus of a soft chancre and the pus of an inoculation-soft sore a bacillus already resembling that described by Ducrey and Krefling, except that there was not such a pronounced constriction in the middle. Unna's alkaline methylene-blue was found to be the best stain. It must be employed for twenty-four hours. The decolorizing must not be effected by alcohol, as this bacillus gives up its stain very readily to that. They are best treated, after staining, with anilin oil three to ten minutes, and then with a mixture of anilin oil and xylol, equal parts. The length of time the preparations are to be treated to this cannot be fixed; in general it is from one-half to three hours. In sections this bacillus is best stained by the following method: Harden pieces of a soft sore in alcohol. Imbed in celloidin; cut sections; wash off in distilled water; spread upon a slide; dry with filter-paper, stain upon a slide from two to five minutes with the following solution: R. Methylene-blue, Potassium carbonate, $\bar{a}\bar{a}$, 1.0; Distilled water, 100.0; Alcohol, 20.0. Heat the above until reduced to 100 cc., then add: R. Methylene-blue, Borax, $\bar{a}\bar{a}$, 1.0; Distilled water, 100.0.

After staining, the surplus stain is absorbed by filter-paper. Decolorization is effected by means of anilin oil and xylol. The solution is made to

contain a little more anilin than xylol. Decolorization takes place very slowly, requiring as long as two hours in some cases, according to the thickness of the section. Clear up with xylol and mount in balsam. The bacilli are to be found mostly in the round cells.

GLANDERS.—To stain the bacilli in sections of the tubercles these two methods are recommended: (a) Dry section on slide, stain with methylene-blue, Loeffler's strong, Kühne's or Unna's compound mixture, for half an hour; wash off with water, subject for several seconds to the glycerol-ether mixture, then wash in water, repeat this latter cycle several times; finally wash carefully in water, absolute alcohol, turpentine oil, balsam. (2) Dry on slide and stain with methylene-blue as above, treat with 1 per cent. solution arsenious acid from five to ten seconds, wash in water, absolute alcohol, turpentine, balsam.

For double staining the following methods are recommended: (1) Leave in acid-fuchsin over night, wash in water, dry on slide, stain with methylene-blue one-quarter of an hour, arsenious-acid solution, 1 per cent., from five to ten seconds; water, alcohol, bergamot oil, balsam. (2) Dry on slide; methylene-blue ten minutes; water; mixture of equal parts of a concentrated watery solution of tannin and a 1 per cent. acid-fuchsin solution fifteen minutes; absolute alcohol, bergamot oil, balsam.

VARIOLA.—Besser has cultivated from the blood and the pustules of small-pox patients, on pepton-agar having a slight alkalinity, a characteristic bacillus. Its length is from $\frac{3}{4} \mu$ to $1\frac{1}{2} \mu$, its width from $\frac{1}{4} \mu$ to $\frac{1}{2} \mu$. Its ends were rounded off, slightly pointed, so that it appeared thicker in the middle than at the ends; spores could not be found. Variations in temperature did not influence it much. It would not grow at temperature of room, but grew slowly in thermostat. The cultures were very sticky. The bacillus stained well with anilin.

LEPRA- AND TUBERCLE-BACILLUS.—Unna gives the following method for double-staining of sections containing lepra- or tubercle-bacillus: (1) The alcohol-prepared sections are placed from ten minutes to several hours in Unna's polychromatic methylene-blue solution. Lengthy sojourn in this stain, even to remaining over night, does no harm except to lengthen the decolorizing process; (2) Wash carefully in water; (3) Place in 33 per cent. watery solution of tannin, where they remain from two to five minutes; that is, until they present a dull grayish-blue tone; (4) Carefully wash in water; (5) The sections come now either direct into absolute alcohol or into a concentrated solution of gold-orange prepared with alcohol. In the latter the sections obtain a yellowish contrast stain, as well as being dehydrated. When an insufficient amount of methylene-blue is given off in the tannin solution, the sections can come for a few seconds in a 25 per cent. solution of H_2O_3 ; (6) Dilute alcohol; water; absolute alcohol; (7) Bergamot oil; balsam.

ORTHOPEDIC SURGERY.

BY V. P. GIBNEY, M. D., AND H. W. GIBNEY, M. D.,
OF NEW YORK.

A NEGLECTED BUT VALUABLE GERMICIDE.

Sulphur in Tuberculous Diseases of the Bones and Joints.—W. Arbuthnot Lane¹ has arrived at the following conclusions as to the effect of sulphur: 1. Neither sulphur nor the products generated by its decomposition act prejudicially upon the life or health of the individual into whose body it is introduced. 2. If placed in contact with recently-incised healthy tissues, twenty-four hours suffice to render the parts sterile so far as organisms are concerned. 3. If a recently-incised or scraped surface be but poorly supplied with blood—as, for example, the brawny edge of a carbuncle or the spreading gangrene of a limb—sulphur may be left in contact with the tissues advantageously for a considerably longer period. This also applies to the granulating surface. 4. The entry of other organisms into a tuberculous cavity does not influence the action of the drug, since it destroys all organisms, whether free in the cavity or intruding into the surrounding living tissues forming its wall. 5. The action exerted by sulphur is a painless one.

THE SPINE AND THORAX.

The Mechanical Treatment of Pott's Disease of the Spine in the Subacute or Convalescent Stage.—J. C. Schapps² advocates a much more extensive support to the thorax than is usually given in spinal appliances, and his apparatus is a Taylor brace supplemented by a thoracic plate and a metallic pelvic band, while he omits the usual abdominal apron.

The History of the Treatment of Spondylitis and Scoliosis by Partial Suspension and Retention by Means of Plaster-of-Paris Bandages.—L. A. Sayre³ has given one of his typically illustrative papers on the use of the plaster-of-Paris bandage, and has succeeded in collecting the opinions of various surgeons throughout the world for and against this form of dressing in spondylitis and scoliosis. The article itself is very interesting to any one interested in an agent so valuable as plaster of Paris.

Congenital Deformity of the Chest.—The deformity, I. S. Haynes⁴ reports, is a deficiency in the cartilaginous formation of the seventh, eighth,

¹ Brit. Med. Jour., 1894, p. 1239.

³ Ibid., March 16 and 23, 1895.

² N. Y. Med. Jour., March 23, 1895.

⁴ Am. Med.-Surg. Bull., Nov. 15, 1894.

and ninth ribs. The case is fully illustrated, and certainly presents a very peculiar congenital deformity, thus adding to the literature of this subject.

THE HEAD AND NECK.

Torticollis following the Removal of Adenoids of the Rhinopharynx.—C. H. Knight,¹ a very careful observer, reports an unusual case described by the foregoing title. The patient recovered within ten days, apparently without any treatment.

THE HIP.

Orthopedic Treatment of Congenital Dislocation of the Hip.—

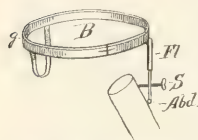


FIG. 1.—Splint devised for the orthopedic treatment of congenital dislocation of the hip (Am. Med.-Surg. Bull., Sept., 1894).

Professor Schede of Hamburg² gives in a letter to one of the editors of this department an account of a splint that differs from the ordinary hip-splint in that the abduction-screw is placed some distance below the point usually selected. The screw exerts pressure upon the thigh portion of the splint. A rude diagram of the splint is shown in Fig. 1.

[It may be quite proper in this resume of the subject to state that the results of treatment by mechanical means are not regarded as very satisfactory in this country. Since this letter was published

Schede has himself published an analysis of his cases showing remarkably fine results. We do not cordially recommend this method of treatment until the details of treatment and the details of results are more fully understood. The splint itself, if correctly figured, must require an extraordinarily close adjustment and extraordinary attention to the maintenance of good position during a long period of time—an attention which even a painstaking German surgeon is not willing to give.]

Congenital Luxation of the Hip.—A. Lorenz³ records a series of operations, 100 in number, performed at the private hospital of Dr. Eder in Vienna, showing no deaths, and 99 healing without any reaction. He argues forcibly for his operation, which does away with division of muscles or tendons. A very good editorial on this paper will be found in the *Annals of Surgery*, June, 1895. The author has recently⁴ published a very interesting volume in which he records the pathology and therapy of congenital dislocations of the hip, with a very full analysis of his 100 cases.

Bending of the Neck of the Femur in Adolescence.—Royal Whitman⁵ calls attention to a deformity at the hip-joint similar in origin to the knock-knee and flat-foot of adolescence, in which, because of local weakness, the neck of the femur bends downward and backward, resulting in elevation and

¹ Am. Med.-Surg. Bull., Oct. 15, 1894.

² Sammlung klinische Vorträge, No. 117, 1895.

³ Urban and Schwarzenberg, Vienna and Leipzig, 1895.

⁴ N. Y. Med. Journal, 1894, pp. 769-774.

⁵ Ibid., Sept. 15, 1894.

prominence of the trochanter. A corresponding shortening of the leg and interference with the joint-functions are the results. The usual symptoms are pain and stiffness referred to the thigh, and a sensation of weakness and discomfort on changing from an attitude of rest to one of activity. The tendency of the deformity is toward outward rotation of the limb and adduction; if it be of one side, the patient limps, and if of both, the adduction may be so marked and the weakness and insecurity so great that a very awkward waddling gait is assumed. Because of the pain and weakness the affection is usually mistaken for hip-disease, but from this the diagnosis should be easily made because of the absence of pain on motion, muscular spasm, and local infiltration, and because hip-disease could not satisfactorily explain the deformity. Congenital dislocation of the hip simulates this deformity most clearly, but in such cases, if the leg be flexed and adducted to the extreme limit, the neck and head of the displaced bone can be easily made out; while in bending of the neck of the femur nothing but the prominent trochanter can be distinguished.

The treatment in the early stage should be rest, massage, and manipulation in the direction opposite to that of restricted motion. Later, crutches or a hip-splint may be employed in addition. In cases of marked deformity an osteotomy below the trochanter for the purpose of overcoming the adduction and outward rotation is recommended. Four cases of this affection, 3 of a single hip and 1 of both hips, are reported and illustrated by figures. The deformity was first definitely described by E. Müller in 1889, but no cases have before been reported in this country.

Lateral Traction in Hip-disease.—O. G. Page,¹ unlike most of the orthopedic writers, in estimating the value of lateral traction bases his paper upon an experimental study, and from this gives the following conclusions: 1. Lateral traction, properly applied, in connection with longitudinal traction, gives relief in some acute cases. 2. Lateral traction alone has no advantage. 3. The amount of weight in lateral traction should be in relation to the amount of longitudinal traction. A good proportion is 5 pounds lateral to 10 pounds longitudinal, applied 25 degrees beyond a right angle. The minimum useful proportion is 1 to 10—the maximum, 8 to 10. 4. The tension on the skin is the most important factor in limiting the amount of traction when the thigh is slowly flexed, abducted, and rotated.

A Method of Preventing Shortening after Hip-disease.—A. B. Judson² makes use of an old principle, but has deemed it of sufficient importance to call renewed attention to it, the plan being an early resumption of symmetrical walking. He takes advantage of every opportunity to drill his patients in a rhythmical gait. [The criticism that has been offered is that it is next to impossible to have a patient with a short limb and wearing a splint adopt a rhythmical gait, and consequently it is not so valuable as the author seems to think.]

Question of Priority in the Use of Lateral Traction for the Relief of

¹ Boston Med. and Surg. Jour., Sept. 13, 1894.

² Am. Med.-Surg. Bull., Jan. 1, 1895.

Intraarticular Pressure.—A. M. Phelps¹ offers an apparently convincing argument in favor of his claim to the priority of lateral traction—a principle of itself not generally accepted as valuable by the majority of orthopedic surgeons.

PIGEON-TOES.

Abnormal Rotation of the Lower Extremities.—Filanus² advises for inveterate cases of pigeon-toe, as described by the author under the title of abnormal rotation of the extremities, a very simple device, shown in the accompanying figure. The bandages are of elastic material attached to a pelvic band, wound spirally around the thigh and leg and attached to the sole of the shoe on the other side. [Just as to how practical a method this is we are unwilling to commit ourselves. It certainly seems worthy of trial, and its simplicity is commendable.]



FIG. 2.—Device for the cure of abnormal rotation of the lower extremities (Am. Med.-Surg. Bull., Jan., 1895).

THE KNEE.

Excision of the Knee for the Relief of Crippling from Infantile Paralysis.—A. M. Vance³ reports very instructive cases, with 2 in which a fatal result occurred. The conclusions are as follows: 1. The danger in these operations is in proportion to the age of the patient, and consequently the degree of fatty degeneration present. 2. That both these deaths were due to fatty emboli or the absorption of some nonseptic material into the blood that caused the fatal heart-complication. 3. That though the younger cases may be subjected to this procedure

with every hope of success both as to function of the stiffened limb and as to life, the rule does not hold good in the older cases, say after ten or twelve years of age.

The Value of Bursal Enlargements as Indications of Incipient Tubercular Arthritis.—D'Arcy Palmer⁴ bases his remarks on the history of 6 cases, 4 of which had promptly recovered after operation. One refused operation, and developed acute arthritis and died. [He does not give any analysis of the contents of the bursæ of cases operated upon, and in the absence of such information one may readily question the value of his observations.]

THE FOOT.

Deformities of the Human Foot.—W. J. Walsham, M. B., and Wm. Kent Hughes, M. B.,⁵ in a recent volume of 550 pages deal with deformities of the foot alone. It is intended to represent the practice at St. Barthol-

¹ Am. Med. and Surg. Bull., Jan. 15, 1895.

² Ibid.

³ Intern. Med. Mag., Oct., 1895.

⁴ Br. Med. Jour., No. 1756, p. 412.

⁵ Wm. Wood & Co., New York, 1895.

omew's Hospital. [One finds much in the book that is old, but much that is practical.]

Excavation of the Astragalus for Inveterate Club-foot.—T. Halstead Myers¹ reports a case wherein this method of handling the astragalus was attended with very good results. It seems to be a practical operation, and theoretically leaves the articular surface undisturbed. After the astragalus is pretty well excavated forcible over-correction is employed. In the author's case good motion at the ankle is reported.

Treatment of Club-foot by the Wolff Method.—A. R. Shands² publishes in detail 9 cases from which a practical study of this method of treatment can be easily drawn. The author shows the simplicity with which aggravated cases can be efficiently managed, and sets forth some valuable points in the use of plaster of Paris. [The paper itself gives one a very good idea of this method of Professor Wolff of Berlin.]

Talipes Calcaneo-valgus, a Case successfully Treated by Operation.—The operation performed by C. F. Gwynne³ consists in the removal of the astragalus through a semilunar incision under the external malleolus. The articular surfaces of the os calcis are removed, and a pretty flat surface obtained, on which the lower extremity of the tibia is placed after the removal of the articular surface. Six months later a good result is reported as obtained and thorough union apparently secured. [The time after operation is not sufficiently long to predicate any permanent result, and it is questionable, therefore, whether this operation will be any advantage over the ordinary operation for arthrodesia.]

A Gaiter and Support for Flat-foot and Talipes Valgus.—W. J. Perry⁴ presents a contrivance, shown in the accompanying cut, consisting of a gaiter of black kid, reaching from the tubercle of the tibia to the malleoli, and lacing in front. A steel bar is sewn into the gaiter throughout its entire length, in order to keep it from wrinkling and to give additional support. To the upper part of this bar a buckle is attached. A piece of webbing then passes around the ankle to the outer side, where one end is buttoned to the main band and is continued under the hollow of the sole to the inner side, where a piece of stout black elastic is attached to it, and to the other end of the elastic a black kid strap, which is then buckled at the top of the gaiter. The elastic and webbing can thus be drawn up to the required pitch and altered at will. He has found it very useful in the atonic form of flat-foot occurring in children that are rather delicate or rachitic. It is not intended for the more severe forms of flat-foot.

The Obliteration of the Anterior Transverse Arch of the Foot as a Cause of Metatarsalgia.—J. E. Goldthwaite⁵ attaches much importance to the transverse tarsal arch and to the obliteration of it as a cause of metatarsalgia. He bases his conclusion upon a study of a large number of feet, but

¹ Am. Med. & Surg. Bull., June 15, 1894.

² Virg. Med. Monthly, Sept., 1894.

³ Sheffield Quarterly Med. Jour., Oct., 1894.

⁴ Lancet, Feb. 16, 1895.

⁵ Boston Med. and Surg. Jour., Sept. 4, 1894.

in giving the impressions of the feet, as in the text, he does not state whether all of these impressions belong to feet suffering from metatarsalgia. He simply states that the obliteration of this arch is very common, and does

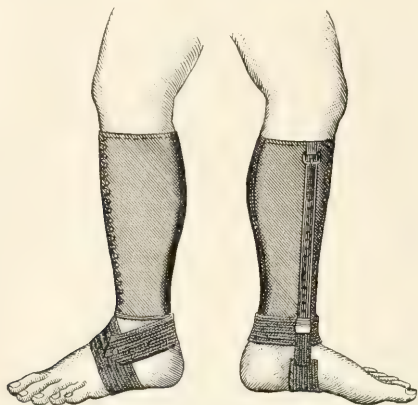


FIG. 3.—Gaiter support for flat-foot and talipes valgus (Lancet, Feb. 16, 1895).

state, finally, that comparatively few with this obliteration suffer any inconvenience. [It would seem, therefore, that he fails to make a case against the obliteration of the arch, but his studies are of sufficient interest to deserve notice in this summary.]

The Non-operative Treatment of Metatarsalgia.—V. P. Gibney¹ advises the use of a boot built on a Spanish last, with a heel that is a combination of an English and French style. A boot thus built transfers the weight from the ball of the foot to the plantar region just back of the ball of the foot, and to that portion of the shank just anterior to the heel. It is very important that the boot should fit snugly around the instep and shank, and that the toe-portion should be loose.

THE HAND.

Remarks on Congenital Contractures of the Fingers, and their Treatment by Forcible Extension.—E. Muirhead Little,² in some practical observations on congenital contractures of the fingers, shows the advantage gained by forcible stretching over that of the division of tendons. He publishes a case in which the cutting operation was done on one hand and stretching in the other hand. The power of flexion is fully demonstrated in the fingers stretched, while the loss of power and a resulting stiff finger is shown in the hand on which the operation was performed. A very simple splint—nothing practically new in it, however—is presented for the maintenance of good posi-

¹ N. Y. Med. Jour., Nov. 24, 1894.

² Inter. Med. Mag., May, 1894.

tion. The accompanying cut shows the splint, which is easily constructed from a tin box and wire. Cutting-plyers and shears are the tools needed.

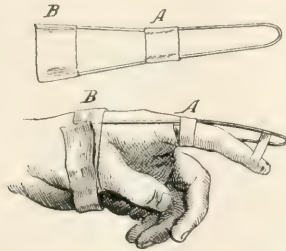


FIG. 4.—Little's Splint (Inter. Med. Mag., May, 1894).

Soldering is not necessary. The splint is secured in position by adhesive straps and a bandage. Elastic extension may be employed, as shown in the cut.

OPHTHALMOLOGY.

BY

HOWARD FORDE HANSELL, M.D., AND
OF PHILADELPHIA.

C. FRANK CLARK, M.D.,
OF COLUMBUS, OHIO.

ANATOMY AND PHYSIOLOGY.

The Function of Schlemm's Canal.—Contention over the function of Schlemm's Canal is still rife. Guttman¹ agrees with the commonly-accepted theory that fluid, and eventually solid elements, are conveyed through the adjoining spaces in the inner wall of Schlemm's sinus,—a term that describes the part better than the word Canal,—and thence through the intercellular spaces in the endothelium, in states of sufficient tension of the cornea and sclera, and by the vis-a-tergo into the sinus itself, flowing out from there into the scleral and conjunctival veins. Leber² is convinced that this assumption is wrong, and asserts that the canal is not simply a lymph-space, but that it has the functions of a blood-vessel; he has found blood in it, and as there is no open connection with the venous system, fluid can pass out only by filtration dependent upon the relation of the intraocular pressure. The existence of secretory glands in that part of the ciliary body between the ciliary muscle and the pars ciliaris retinæ, discovered by Collins, the function of which is to supply in part the aqueous humor, is corroborated by Griffith.³ Puncture of the normal anterior chamber of the eye yields a clear fluid that does not coagulate on standing and that contains neither fibrin nor albumin. A second puncture, however, yields a fluid that while clear coagulates immediately, is rich in albumin and fibrin, and resembles blood-serum in composition. With a view to determining the cause of this change in the fluid, Greeff⁴ undertook a series of experiments on rabbits. "Remarkable changes were found, not in the iris or anterior chamber, but in the ciliary processes alone." Numerous large vesicles appeared in the ciliary processes immediately after the puncture (see Plates 23 and 24), formed by the elevation of the epithelial covering and containing coagulated masses such as are found in the anterior chamber, with clusters of red blood-corpuscles and occasionally white ones. These vesicles, at first small, soon grow large, and, bursting, evacuate their contents into the posterior chamber.

¹ Graefe's Arch. f. Oph., Bd. xli., Abt. 1.

² Ibid.

³ Oph. Rev., Aug., 1894.

⁴ Arch. Oph., Jan., 1895.

The ciliary processes also exhibit a noticeable hyperemia and marked edema, with some small hemorrhages.

Corneal Nutrition.—Gruber¹ believes that the circulation through the cornea of diffusible crystalloid bodies is accomplished by means of mechanical currents and diffusion-currents, but that of nondiffusible colloid substances like serum and the nutritious material of the cornea is accomplished only by the vital activity of the corneal tissue.

The Earliest Age at which the Lacrymal Secretion is Evident is twenty-five days, at which time the gland is hardly distinguishable from its bed of fat and is disproportionately small.²

The Nerve-supply of the Lacrymal Gland is said by Tipliachine³ to be derived from the cervical sympathetic. The normal and continuous secretion of tears can not be considered as an effect only of a reflex from excitation of the anterior part of the globe, and does not depend upon the secretory nerve-filaments of the lacrymal and malar nerves. The augmented secretion, provoked by various reflexes and psychic emotions, is controlled by filaments that have their origin in the intracranial trunk of the fifth nerve. As disproving this theory, Goldzieher, supported by the observations of Moll,⁴ has called attention to the one-sided absence of the secretion of tears in superficial paralysis of the seventh nerve,⁵ and states that the seventh nerve is the innervator of reflex and emotional weeping, while the regular moisture is supplied by the conjunctiva, and in cases of paralysis of the seventh, when the lesion is in the upper part of the ganglion geniculi, or even higher, there is loss of function of the tear-gland on that side. This has been verified by Jendrasik. The seat of the lesion is to be sought in the inner half of the cavity of the skull and with probability in the pyramidal fibers connecting the nucleus of the seventh,—the fibers that arise out of the facial nucleus connecting the ganglion geniculi, by the superficial major petrosal nerve, with the gland.

Physiologic Changes in the Size of the Pupil are controlled by the sphincter iridis branch of the third (contraction) and the sympathetic (dilatation). The existence of a dilator muscle is doubtful. The weight of authority⁶ seems to be in favor of the presence of a radiating muscular layer of spindle-cells on the posterior surface of the iris. Juler⁷ describes a muscle lying next to the posterior epithelial coat. The function of this muscle, he believes, is twofold: first to dilate the pupil; second, to close the spaces of Fontana by pulling upon the fibers of the ligamentum pectinatum. The reflex action of the pupils is due to a special set of fibers in the optic nerves the only function of which is to carry to the pupillary nucleus of the third

¹ Graefe's Arch. f. Oph., Bd. xl., Abt. 4, 1894.

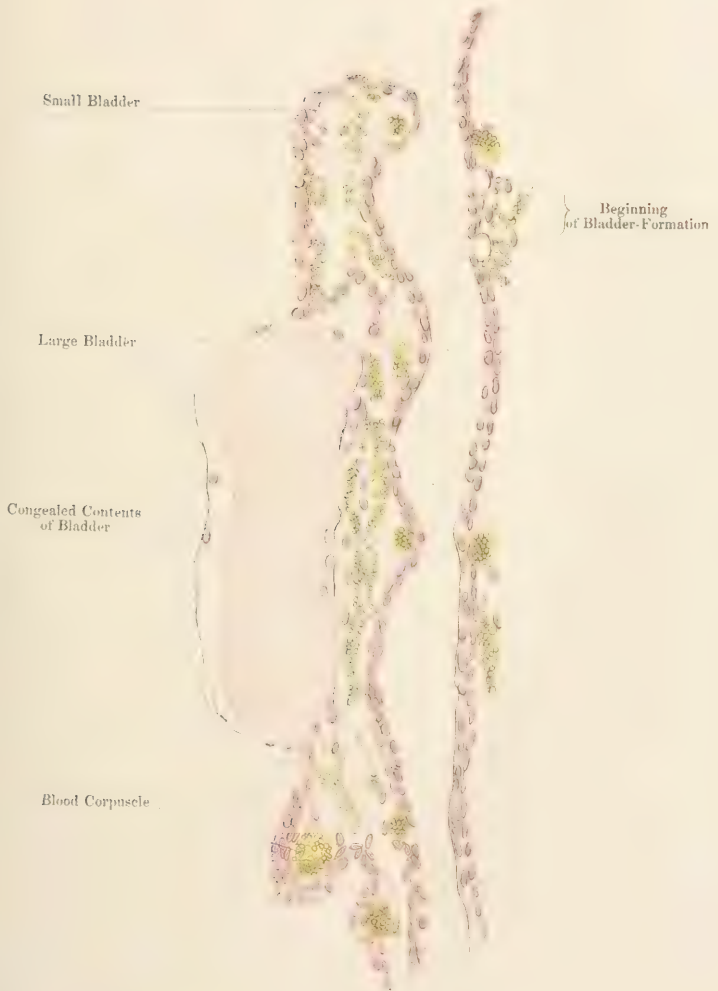
² Fritz Kirschstein, Inaug. Dissert., Berlin, 1894. ³ Arch. d'Oph., July, 1894.

⁴ Centralbl. f. prakt. Augenh., Mar. and Mai, 1895.

⁵ Oph. Gesellsch. z. Heidelberg, 1893.

⁶ Merkle and Bonnet, Klin. Monatsbl. f. Augenh., Feb., 1895, quoting Hense, Langley, Anderson.

⁷ Trans. 8th Int. Oph. Cong., 1894.



Changes in the anterior chamber after puncture of the ciliary body.
(Arch. Oph., Jan., 1895).



Lens
Lensepithel
Lenseap

Small Bladder

Large Bladder

Congeaed Contents
of Bladder

Blood Corpuscle

Processus ciliaris

Corpus ciliare

Changes in the iris after puncture of the cornea
(Arch. Oph., Jan., 1895).





the stimulation of light, and not to excite the ordinary or seeing nerve-fibers.¹ Braunstein² experimentally demonstrated that reflex dilatation of the pupil, following irritation of the nerves of sensation, does not ensue through the sympathetic, but represents an act of inhibition induced through limitation of the action of the third nerve. The cortex of the hemispheres exercises an inhibitory influence both on the center of the third and on the apparatus that provides for the carrying of reflex influence from the sensitive nerve.

Schirmer's examination of the healthy eyes of young persons shows :³—
1. When the condition of adaptation (previous darkness or light) remains unchanged, the size of the pupil varies with the illumination. 2. When the illumination is unchanged, but the adaptation-conditions alter, the size of the pupil varies. 3. By varying illumination the size of the pupil remains unaltered, provided the relation of the adaptation to the illumination remains the same.

Under different colored lights of equal luminosity the size of the pupil does not vary.⁴

The Physiology of the Movements of the Eyes.—The literature has been enriched by the report of the investigations of Sherrington⁵ and Russell, the former of whom has demonstrated that in the monkey, in which the optic axes are parallel, stimulation of the cortex cerebri after division of the third and fourth cranial nerves on the left side gives rise to conjugate movements of both eyes toward the opposite (right) side, the left eye, however, travelling only so far as the median line. In other words, the "inhibition of tonus" was such that relaxation of the rectus externus of the left eye kept accurate time and step with the contraction of the external rectus of the right eye. [These experiments and observations are of extreme importance to us in the study of strabismus, and it would be well if operators would bear in mind the fact that on the simple relaxation of a rectus muscle an eye will return to its primary position only when its setting in the orbit is such that the tensions of its nonmuscular connections when in a state of equilibrium will bring it to that position.] He calls attention to the resistance offered by these nonmuscular connections and the tendency of the normal eye to return to its primary position even when the third, fourth, and sixth nerves are divided. Risien Russel⁶ concludes that probably all ocular movements are represented in the cerebral cortex. The ocular effect produced by ablation of part of the cerebellum is paralytic, but whether from direct influence of the cerebellum on the muscle, or indirectly through the loss of the cerebellar influence over the cerebrum, is uncertain. Nystagmus may be irritative

¹ Heddaus, *Centralbl. f. prakt. Augenh.*, Jan., 1895.

² *Zur Lehre von der Innervation der Pupillenbewegung*, 1894.

³ Graefe's *Arch. f. Oph.*, Bd. xl., Abt. 5, 1894.

⁴ M. Sachs, *Pflüger's Arch. f. Phys.*, lii., *Oph. Rev.*, Oct., 1894.

⁵ *Jour. Physiol.*, vol. xvii., Part 1.

⁶ *Jour. Physiol.*, vol. xii., 1, 1894.

or paralytic—probably the former, through weakness of certain muscles. Two antagonistic influences appear to be exerted on the extrinsic muscles, one by the opposite lateral lobe of the cerebellum, the other by the eye-area of the opposite cerebral hemisphere. One lateral lobe of the cerebellum and the opposite cerebral hemisphere act in conjunction and induce movements of the eye in one direction; the other lateral lobe of the cerebellum and the other cerebral hemisphere are responsible for an influence tending to move the eye in an exactly opposite direction.

The position of repose in healthy eyes varies with the refraction, vision, and “physiologic habit.” Parallelism and divergence represent the majority, although convergence is the rule when clear retinal images depend upon the contraction of the ciliary muscle.¹ The external ocular muscles do not contribute to accommodation by pressure on the globe. Sattler² finds there is no difference in the refraction of the eye by parallel or convergent visual lines, whether in the horizontal plane or not, provided the ciliary muscle is paralyzed or the eye aphakic.

Accommodation Lenticonus.—Leopold Miller³ succeeded in extracting all pigments from normal irides and found that in accommodation the posterior surface of the lens was greatly convexed, resembling lenticonus.

Action of the Orbicularis Muscle.—The anterior section of the eye is compressed to some extent by the action of the orbicularis muscle,⁴ which, by means of the tendon and neighboring aponeurotic fibers, has its internal insertion absolutely fixed—everywhere else the insertions being in the deep layers of the skin. The contraction and even the tonicity of the straight and oblique eye muscles modify, through the superficial aponeurotic sheath, the direction and action of the orbicularis muscle.

Subjective Photopsia is often due to a disease of the brain, although, according to von Zehender,⁵ objective retinal images are entirely physiologic. An objective retinal picture is called forth by material objects, and a subjective one by things that originate within the eye;—the latter must be distinguished from “remembrance” pictures. Zehender’s experiment on himself is as follows: While sitting with his back to a window through which a good light is coming, and holding a sheet of white paper at the usual reading distance, after having the eyes closed for a moment and then opening them, a projection of the retinal vessels and of the optic disc will be thrown forward on the paper, fading almost immediately. The projection can be repeated for a few times. The circulation of the blood cannot be seen. The experiment frequently fails, owing to insufficient or too much light or other unknown conditions. The method is purely subjective and requires no artificial means for its production.

¹ J. Reboud, *Arch. d’Oph.*, Nov., 1894.

² Graefe’s *Arch. f. Oph.*, vol. x1, Abt. 3.

³ *Wien. Klin. Woch.*, No. 4. *Klin. Monatsbl. f. Augenh.*, Feb., 1895.

⁴ *Fevrier, Ann. d’Ocul.*, Oct., 1894.

⁵ *Klin. Monatsbl. f. Augenh.*, Mar., 1895.

Comparative Anatomy of the Retina.—Greef¹ found that there is a remarkable similarity in the structure of the retina in all the five animal classes—bony fishes, frogs, reptiles, birds, and mammals—examined. The changes are, in the main, limited to the thickness of the individual layers of the retina and the form and thickness of the rods and cones. The rods, by virtue of the greater or less thickness and form and the extension of their terminations in the outer reticular layer, are susceptible of noteworthy changes. The differences may be so characteristic that one can frequently determine the class to which they belong. The cones, on the other hand, show but few deviations. It does not appear that the retina becomes more perfect as one ascends into the higher classes.

Physiology of the Retina.—Bidwell² distinguishes several acts of the retina as the result of strong light, namely, perception, reaction, sense of abnormal darkness, and a transient perception. Hess's³ experiments in the same line prove that after exposure to white light $\frac{1}{100}$ sec. the sensation of light diminished very rapidly and was followed by a dark image and this by the white again. (Exposure to a colored light produces an after-sensation of the complementary color.) The experiments support his assumption of separate perception of white and colored valencies and not the theory that attributes the perception of white to the simultaneous perception of various colors.

In studying the relation of two fields with different degrees of luminosity if simultaneously observed, Hess, in conjunction with Pretori,⁴ noticed that the small field, if surrounded by a larger one having a different luminosity, shows an apparent luminosity that depends upon its own illumination and upon contrast, and that remains invariably the same if the two illuminations of both the fields are changed in such a manner that the two sources of illumination have a certain ratio independent of their absolute magnitude. The clearness or acuteness of vision does not depend as much upon the functional activity of the nerves of the ocular apparatus, the size of the circles of diffusion, and their relation to the size of the retinal image, as upon the special faculty—acquired—of perception in circles of diffusion.

The element of fatigue of the retina or of the perceptive centers demands consideration in physiologic experiments and pathologic examinations. Groenouw⁵ determined that while continuous testing will diminish the size of the visual field, the fatigue-curves are not regular, and in some cases only homonymous sectors of the field of the second eye were simultaneously diminished without direct testing, while in others nonhomonymous sectors

¹ "Die Retina der Wirbelthieren Nach Arbeiten von Ramon-y-Cajal." Richard Greef, Wiesbaden, 1894. (Extract from Monatsbl. f. Augenh., Jan., 1895.)

² Oph. Rev., Nov., 1894. ³ Pflüger's Arch. f. Phys., Bd. xlix., Oph. Rev., Oct., 1894.

⁴ Graefe's Arch. f. Oph., Bd. xl, Abt. 4, 1894.

⁵ Arch. Oph., July, 1894, "Is the Co-excitation of Homonymous Sectors of the Visual Field," etc.

gave evidence of having been fatigued. The fact that the visual field becomes limited during certain examinations, conducted in the manner described by Foerster, Wiltbrand, and Saenge, is admitted by R. Simon.¹ He proves, however, that these limitations must be referred partly to a faculty of perception that is too small in comparison with the excited sensation, and partly to a fatigue of the brain. The retina enters into the phenomena only secondarily. Clinically, according to Kalz,² exhaustion after prolonged near-use of the eyes depends upon irritation of the accommodation, convergence, or retina. In the last the sensitiveness to light declines, and the distinction between black and white becomes feeble. The exhaustion is indicated by gradually-increased frequency in winking. Thus, by a specially-constructed measuring and recording instrument the author finds:—1. With Edison's electric light, 10–12 candle, the average winking in ten minutes, to be 1.8 to the minute; the first five minutes 5 times, the second five 13 times. 2. With gas-illumination (same power) the average was 2.8 per minute; first five minutes 9, second 19. 3. With weak light, 6.8 per minute; first five minutes 25, second five minutes 43. Exhaustion of the visual center, from a constant drain on vitality, is mentioned by Hinde³ as a cause of monocular amaurosis that persisted three months in a nervous, hysterical woman.

Studies in Color Sensation.—Starting with the fact that marked visual disturbance is not inconsistent with V. $\frac{5}{5}$, Wolffberg⁴ makes three classes of disturbances. Those of the dioptric, of the neuroptic (neuropathic), and the photochemic apparatus. By the last he means the layer of outer nuclei, membrana limitans externa, layer of rods and cones, and the pigment-epithelium of the retina. For the examination of the photochemic apparatus, to which he attributes mainly the function of the light-sense, he objects to Förster's photometer and Masson's disc that they do not give strict information whether the patient's macula or a peripheral part of his retina is employed, and as not eliminating the influence of dioptric and neuroptic factors. He advocates a new method for the macula, referring to the two laws proposed in his former work ("Ueber die Prüfung des Licht-sinnes"), that in diseases of the neuroptic apparatus blue is seen better than red, while in diseases of the photochemic apparatus red is seen better than blue. In his new method he makes use of two colored objects, red, r.² (piece of cloth), 2 mm. diam., on a black background, and blue, bl.⁷, 7 mm., on a black background. He finds that they disappear together at 18 mm. in the open air and at 6 mm. in his room. He constructs by careful observation in emmetropes a table giving the connection between the reduced illumination, the visual acuity, and the distances at which r.² and bl.⁷ vanish. In a second table he further shows

¹ Graefe's Arch. f. Augenh., Bd. xl., Abt. 4, 1894.

² Klin. Monatsbl. f. Augen., May, 1895.

³ Med. Rec., Dec. 1, 1894.

⁴ "Ueber die diagnostische Bedeutung der Augen-functionspruefung," Beit. z. Augenh., Hft. xvii., 1895.

how in the same light the absolute and relative distances at which r.² and bl.⁷ disappear and change with the different refractive and neuroptic disturbances, in order to enable the observer to judge at once of the refractive condition or disease. [This monograph gives undoubted evidence of very careful work, but we are afraid for general use the tables are too cumbersome, and, moreover, they would not apply with their special numbers to other rooms in which different conditions of illumination exist. This method further seems to have a fundamental error, namely, the estimation of the red and blue light-sense from the distance at which, not the color alone, but the white light reflected from the colored objects, disappears. This certainly enters to a great extent into the question, so that not the color-sense alone is appealed to, but the general light-sense. We also believe, with Seggle, that the apparent increased red-light sense of myopia and the decreased blue-light sense of hyperopia has its real cause in the chromatic aberration of the eye, because in the examination as conducted by the author the eyes are induced to relax all accommodative effort, whereby, as is well known, the myope becomes better adjusted for red and the hypermetrope better for blue rays.]

Prof. Mauthner's "*Farbenlehre*"¹ is a new edition of the author's work on color with many changes, and forms the first part of his "*Functions-prüfung*." He follows in the main Hering's theory of color-perception, although he modifies it somewhat when he employs it to explain the phenomena of color-blindness. It is therefore to be expected that the Young-Helmholtz theory is rejected even in all its later modifications by Fick, Raehlmann, Leber, König, and Helmholtz. [We believe, however, that his criticisms are not always tenable, especially those on page 157, where he apparently misinterprets the real views of Helmholtz as to the perception of colors in the color-blind. But the book of such a master is certainly excellent reading and may be recommended even to the beginner, as not only is all the apparatus carefully described, but also the optical principles involved are lucidly stated. For example, his description of a Nichol's prism and of Chibert's chromato-photoptometer are excellent. He recommends as practical tests the pseudoisochromatic tablets of Reuss, Stilling, and Pflüger and Holmgren's worsteds. We miss Thomson's color-stick, extensively utilized in the United States, and his new wool-test for lay-examinations of railroad employees for color-blindness.] Mauthner thinks railroad men should be examined by night with the same lights that are used on the road. Examinations for color-blindness should be extended to include all men in the merchant-marine service, engineers, motormen, etc.² F. Beetz³ objects to the use of the blue glass ordinarily employed on railroads because in foggy weather the blue rays are difficult to see, and he proposes a modification both of the thickness of the glass and the intensity, which is free from this serious objection.

¹ Wiesbaden, 1894.

² *Med. News*, Oct. 27, 1894; May 16, 1895.

³ *Münch. Med. Woch.*, March 5, 1895.

The instrument employed in the experiments on color-vision by Abney¹ consisted of a number of prisms, lenses, and reflectors, by means of which colored light from any part of the spectrum or from several parts simultaneously can be thrown on a screen, and, in juxtaposition, a patch of white light for comparison. The luminosity of both is capable of variations. He demonstrates that the eye is unable to distinguish between the sensations produced by a single spectrum color and by certain mixtures of colors, and that the power of analyzing color-sensations is very limited. He infers that vision is really trichromic; the base of every color-sensation is white light, or, in other words, every color when sufficiently reduced in luminosity is seen as white light. A person with normal vision viewing a spectrum the luminosity of which is continuously lowered passes through a state of red blindness, then one of monochromatic vision. He suggests a modification of the Young-Helmholtz theory on the ground that each of the primary color sensations may be compounded of fundamental light and of color in definite and fixed proportions, the proportions being different in each, and further that the perceiving-apparatus of each of the three primary sensations has two functions—one to respond to the white, the other to the color. He believes that the cause of vision will be found in the chemic action induced by impact of the different wave-lengths of light falling on the sensitive matter, and gives some remarkable analogies between the reactions of the retina and those of the sensitive salts used in photography. He calls attention to the fact that while experimenting and in drawing conclusions in clinical cases much depends on the size of the color-test and the distance of the observer, small colored objects being less readily recognized than larger ones. He considers the spectrum the most accurate test, and particularly useful in detecting malingering.

Ebbinghaus² objects to the Young-Helmholtz theory and states his own, a modification of Hering's. He attributes the process of color-vision to three substances in the retina: 1. A white substance that has only to do with light-perception. 2. A blue-yellow, identical with the visual purple. 3. A red-green, that has to do with perception of red and green. Hering's view of anabolic processes in these substances giving rise to color perception is not accepted by him. [This theory seems to us by no means able to defeat that of Helmholtz. It appears to have many objections, some of which have been well stated by Franklin³ in "Mind," to which the reader is referred.] Hering's rules for the perception of light and colors in the macular region are briefly stated thus:⁴— 1. Spectral resemblances (*gleichungen*) between white lines placed together in a large field are not real but apparent, in con-

¹ London: Simpson, Marston & Co., 1895.

² *Theorie des Farben-Sehens*, Zeitschrift f. Psych. u. Phys., V. Sinnesorg., vol. iii.-iv., Centralbl. f. Augenh., Jan., 1895.

³ New Series, N. Y.

⁴ Pflüg. Arch., Centralbl. f. prak. Augenh., Feb., 1895.

sequence of unequal pigmentation of different zones of the macula. 2. These resemblances are more correct the smaller the field. 3. Resemblances become unresemblances according to the intensity of the illumination. 4. The resemblances are correct if the field is small and the intensity of the light not modified. The above rules hold for colors.

The development of the perception of colors in infants, in fish, and in puppies has been studied, the first by Garbini.¹ For the first few days after birth the infant, like the young of the lower animals, dislikes light. Development of the light-sense proper occurs from the fifth to the thirtieth day. Vision proper first appears and develops between the fifth week and eighteenth month. In the sixteenth month color-perceptions begin to be manifested in the following order:—red, green, yellow, orange, blue, and violet,—and are fairly completed by the fourth year. Among 557 children he found none color-blind. [These statements, difficult to verify, can hardly be accepted as absolute.]

The second paper, by Bernbacher,² reports experiments carefully conducted with the eyes of fish to compare the reaction and effect of coloring matter in eyes that have been exposed to light, and others that have been in dark tanks for an equal number of hours. Changes were noticed, induced not only by light but by warmth, pressure by the fingers, and the condition of nutrition. A retina exposed to darkness is alkaline, in reaction to light acid. The former shows colors well, the latter badly. There may be a molecular change only, but it is probable that there is a chemie one also. [The effect of contrast-colors instead of darkness and illumination should be determined by experiment.]

Gates³ studies the effect of exposure upon the functions of sight in three puppies from the same litter, one of which failed to receive any attention, the second being excluded from light from the moment of birth, while the third was subjected to so thorough a training with colors that it was able to discriminate fifteen different tints. Microscopic examination of the visual cortex of the second showed utter want of development, and in the third an increase of density of structure, of cell-elements, and greater vascularity than in the first, closely simulating the human brain in the same region.

Reber⁴ reports six instances of color-blind women occurring in two generations of one family. A man belonging to a family consisting of three brothers and three sisters, all of whom were color-blind, married a woman who, though possessed of normal color-sense, had an only brother who was entirely color-blind. As a result of this marriage four sisters and one brother were born, all of whom had defective color-sense. One of the daughters had three sons and one daughter, and while the daughter was immune, two of the sons were

¹ Archives per l'Anthropologia, Ref., Edin. Med. Jour., Jan., 1895.

² Graefe's Arch. f. Ophthal., Bd. x., Part 5.

³ N. Y. Med. Times, July, 1894.

⁴ Med. News, Jan. 26, 1895.

also color-blind. Unfortunately, the color-sense of the grandparents was unknown.

Hering¹ reports a case of blue-yellow color-blindness, a condition that is extremely rare.

CONGENITAL MALFORMATIONS.

Hock's monograph, "*Congenitalen—Anomalien des Auges*," which appeared in 1893, is probably the most authoritative recent work, and except the reports of a few cases, very little has been added during the past year to our knowledge of the subject.

Lippincott² had a six-weeks old infant under his care, in which, from intrauterine disease, both upper lids were inverted, causing ulceration of the cornea.

Two brothers were the subject of congenital trichiasis.³

Landes⁴ reports the case of an infant in which both eyes were absent. There were 6 fingers on each hand and 6 toes on each foot. The child lived a few weeks. [Congenital microphthalmus is commonly associated with deformities of other parts of the body.] Bernheimer⁵ reports a case of microphthalmus with spinal curvature and other skeletal irregularities, hydrocephalus, and brain-cysts.

Purtscher⁶ reports an unusual case. In a five-weeks old child a deformed upper lid covered and was adherent to a cyst the size of a plum. The cyst was connected by a $2\frac{1}{2}$ mm. band with the opaque cornea of the small globe. When punctured a yellowish fluid flowed from the cyst. The other eye was normal. In a few months both cyst and globe had atrophied and shrunken. The writer argues that the cyst held a close causal relation to the development of the ball because: 1. Cysts of the upper lid have never been described. 2. There was intimate anatomic connection between the cyst and the globe. 3. Atrophy of the globe followed puncture of the cyst. 4. Of analogy with cases of cysts of the lower lid with microphthalmus. 5. In the examination of a similar case Fuchs found gliomatous cells. Campbell⁷ reports a case of complete ankyloblepharon, probably congenital. The united lids confined a large amount of semipurulent lacrymal secretion, forming a rounded, dull-red tumor completely concealing the right orbit. The skin in the upper part yielded and the tumor collapsed. The palpebral slit was reopened and the conjunctival sac dilated.

The influence of heredity in the causation of congenital defects is strikingly illustrated by DeBeck.⁸ In three generations, twelve members of one

¹ Pflüger's Arch. of Phys., xlix., p. 563, Oph. Rev., Nov., 1894.

² Trans. Am. Oph. Soc., 1894.

³ Lancet, Dec. 23, 1894.

⁴ Med. Rec., Nov. 3, 1894.

⁵ Arch. Oph., July, 1894.

⁶ Int. Klin. Rund., Aug. 28, 1894.

⁷ Am. Jour. Med. Sci., Jan., 1895.

⁸ Trans. Am. Oph. Soc., 1894.

family had either coloboma iridis, or irideremia. He performed operations for the cure of cataract on two brothers. The extraction was attended with difficulty in all four eyes and followed by cyclitis. The result was good in one eye of each patient, the eye more recently blind. DeBeek thinks that opaque lenses in colobomatous eyes should be extracted as early as possible.

A case of binocular coloboma of the lens, in the lower quadrant, with retention of accommodative power, in high myopia and lenticular astigmatism, is reported by Clark.¹ The same writer² also reports a case of congenital dislocation of both lenses. The lenses moved freely through the pupil from the vitreous into the anterior chambers. The condition remained unchanged for four years, when glaucoma supervened. The association of persistent hyaloid artery and coloboma of the choroid in the macular region is not an uncommon congenital defect.³ Howe⁴ reports three cases of ectropion uvea, more properly papilloma iridis, in which he and others who have reported cases trace the connection between the extrusion of the uveal coat into the pupil and the distention of the choroid in the elongated eye of myopia. Dunn,⁵ who reports a case of double uveal ectropion, believes that there is no such connection. Posey⁶ had a case of coloboma of the macular region in a patient who had a supernumerary tooth. He believes both defects were inherited, as the patient's mother had, also, a supernumerary tooth.

A resume of congenital defects of movements of the eyes is given by Carl Kuhn,⁷ and is an exhaustive analysis of 73 cases, considered clinically and didactically. Some or all of the muscles may be absent, or two or more may be amalgamated, with anomalies of insertions, false, double, or degenerated. Accommodation and pupillary disturbance is absent in congenital nuclear disease. The congenital may be monocular, the acquired is always binocular. Schirmer⁸ reports a case of unilateral loss of movement after influenza. Secondary deviations are wanting in the monocular variety, because the associations of the sound muscle in lateral movements has never existed. In congenital paralysis the muscles may remain intact. Progressive muscular dystrophy, found only exceptionally, is a disease that concerns the muscles alone. An internus that functionates in convergence and refuses in lateral movements can be caused only by cerebral lesion. The cases in which the disease is observed in several generations, or in several members of one generation, are almost exclusively congenital. Syphilis and alcohol are not causes. Binocular vision in normal eyes is not acquired until from the fourth to the sixth year. In some cases it is never acquired, or if acquired is lost through functional derangement. Cases are known in which children beginning to squint after the sixth year always have diplopia, but it does not

¹ Trans. Am. Oph. Soc., 1894.

³ Louis Stricker, Arch. Oph., July, 1894.

⁵ Virg. Med. Mon., May, 1894.

⁷ Beit. z. Augenh., Heft xix., 1895.

² Loc. cit.

⁴ Trans. Am. Oph. Soc., 1894.

⁶ Univ. Med. Mag., Nov., 1894.

⁸ Klin. Monatsbl. f. Augenh., Aug., 1894.

annoy them, nor is it even noticed until the attempt is made to demonstrate it. Stereoscopic exercise is of no use in the diagnosis, but is useful after operation. In most of the cases of congenital muscular anomalies vision is below normal. Inheritance plays an important role. If the center is destroyed, the peripheral nerve-course degenerates; but if the center never existed, the function fails, but not the muscular structure.

The perplexities of learning to see after twenty-six years of blindness from congenital disease, as described by a patient of Franke,¹ reminds one of the experience of Shelley's Frankenstein. The patient was operated on successfully for congenital double cataract at twenty-six years of age. The author describes the difficulties the patient had of recognizing by means of vision the objects he had hitherto known through his other senses, and his slowness in learning to estimate distances and the comparative size of objects.

AMETROPIA, ITS CORRECTION, SEQUELS, ETC.

Asthenopia.—[Accommodative asthenopia is an inability to use the eyes for near work, for an ordinary length of time, on account of pain in the eyes, or defective vision, arising from congenital or acquired want of focal relation between the refracting media of the eye and the retina. At birth the eye is emmetropic, hypermetropic, or astigmatic, rarely myopic. In hypermetropia and hypermetropic astigmatism, excessive contraction of the ciliary muscle for far or near sight is demanded in the interests of clear vision; in myopia, the contraction of the interni muscles is relatively too great for that of the accommodation; hence accommodative asthenopia arises in all conditions of ametropia.]

CAUSES OF ASTHENOPIA.—The causes are local,—errors of refraction,—or constitutional. Among the latter, Page² mentions a case due to diabetes, Myles,³ to tumors and hypertrophic tissue in the nasal passages, producing asthenopia by pressure on the branches of the fifth nerve and by extension of the inflammatory process to the conjunctiva; Sayre,⁴ to several cases dependent upon phimosis; Goffe,⁵ to uterine disease and to masturbation, in which the cerebral symptoms indicated brain-lesion; Wherry,⁶ to constipation; and finally Webster,⁷ following nephritis and diphtheria, cured by correction of hyperopia and astigmatism. Other causes, either independent of or in conjunction with ametropia, may cause asthenopia that can not be relieved by wearing glasses alone, such as abuse and overuse of the eyes, working in insufficient illumination, excessive use of tobacco and other narcotics, bad teeth, or diseases of nutrition.

Effects of Ametropia.—Optical defects give rise to a great variety of

¹ Beit. zur Augenh., Hft. xvi., 1894.

³ Ibid.

⁴ Ibid.

⁶ The Practitioner, London, Nov., 1894.

² Med. Rec., June 13, 1894.

⁵ Ibid.

⁷ Arch. Pediat., May, 1894.

symptoms. For example, Gould¹ reports 3 cases of nocturnal enuresis cured by wearing an accurate correction for high degrees of ametropia. It is not possible to judge of the nature or degree of the defect from the patient's statements, for low degrees of eye-strain in certain dispositions may indicate functional or organic disturbance, while in others they are unheeded, or, as expressed by Hotz:² "Many eyes can endure a great amount of strain with impunity, while other eyes are so constituted that their powers of endurance are quickly exhausted. One person may need glasses for the correction of a small amount of ametropia, while in another the correction of a much higher degree is unnecessary, and glasses would be superfluous. We can not draw the line at a certain amount of ametropia, but should correct it, no matter how slight in degree, whenever it leads to disturbances of which eye-strain constitutes the most frequent cause."

If there remained a doubt in the mind of any one as to the necessity of correcting low grades of refractive error, the character of the testimony furnished by the numerous papers that have appeared during the past year should certainly remove it. For example, Gould,³ Pilgrim,⁴ and Chisolm⁵ give strong evidence of the value of the correction of apparently insignificant optical defects and muscular anomalies.

Astigmatism in Myopia.—Martin,⁶ in a study of 1240 myopes, concludes that corneal astigmatism is more frequent in the myopic eye than in that which is not myopic; the frequency of the corneal astigmatism increases with the degree of the myopia; the corneal astigmatism is higher in degree in the myopic than in the nonmyopic eye; the degree increases with the degree of myopia; the degree of astigmatism of the nonmyopic eye increases with the degree of the myopia of the other.

PREVENTIVE TREATMENT.—The influence of wearing accurate corrections of astigmatism on the growth of myopia is positively shown by Risley,⁷ who analyzed the results in 200,000 eyes. There was a steady decline in the percentage and grade of myopia in ten years among patients in Philadelphia. Risley attributed this good result mainly to the correction prescribed under mydriasis. Pischl⁸ demonstrates anew that the degree of myopia increases from the lower to the higher grades of school-life.

SOCIAL ASPECT.—By defective vision a youth is handicapped and can not thus compete with his more fortunate fellows in the struggle for existence. Van Fleet⁹ has found, by an examination of criminals, that there is among them a higher percentage of bad vision than among a corresponding number of noncriminals. His testimony is corroborated by White¹⁰ and Starkey.¹¹

¹ Med. News, Dec. 15, 1894.

² Brit. Med. Jour., Sept. 15, 1894.

³ Trans. Eighth Ophth. Congress, 1894.

⁴ Arch. of Ophthal., July, 1894.

⁵ Am. Med.-Surg. Bull., Nov. 15, 1894.

⁶ Jour. Am. Med. Assoc.

⁷ The Refractionist, Dec., 1894.

⁸ Ann. d'Oculist, July, 1894.

⁹ Jour. Am. Med. Assoc., Sept. 15, 1894.

¹⁰ Trans. Am. Ophthal. Soc., July, 1894.

¹¹ Jour. Am. Med. Assoc., Sept. 8, 1894.

The symptoms in the order of their frequency among 2000 ametropic eyes, as given by Marlow¹ are: Headache, 75 per cent.; nausea and vomiting in 187 of the 755 cases of headache; photophobia, 49 per cent.; defective vision, 48 per cent.; vertigo, 29 per cent.; lachrymation, 28 per cent.; diplopia, 81 per cent. *Mental Symptoms*: Depression of spirits, confusion of thought, nervousness, irritability of temper, etc., 7 per cent.; insomnia, 6 per cent.; nausea independent of headache *as a direct result* of eye-strain, 2 per cent.; epilepsy in 1 case; chorea, 5 cases; conjunctivitis and Meibomian tumors, 51 cases; blepharitis, 18 cases. [Marlow's excellent paper is incomplete in that he makes no mention of the ophthalmoscopic appearance of the eye-ground, which in some cases of asthenopia, particularly when headache is a symptom, presents indications of hyperemia of the optic nerve and retina.] Pooley² mentions this condition. In six cases of high and low degrees of ametropia, Hennessey³ describes symptoms similar to those named and lays particular stress on the frequency of chronic blepharitis marginalis. The causative relation of defects of refraction to epilepsy is considered by Dodd.⁴ Among 100 cases of epilepsy 75 were considered to need glasses and 52 of these carried out the treatment and wore them; 13 had no recurrence of fits during periods varying from four months to one year, 3 remained unchanged, and 36 were improved. He is convinced that errors of refraction may cause epilepsy, and the correction of these errors will, in combination with other treatment, in many cases cure or relieve the epileptic condition. The dependence of chronic dyspepsia and other disorders of digestion on eye-strain—conditions noticed by Gould and others—is, according to Marlow,⁵ far more frequent than is generally supposed. They are not the result of reflex action, but a neurasthenia induced by excessive expenditure of nerve-energy in maintaining clear and single vision. Buller⁶ is not prepared to acknowledge that dyspepsia is one of the symptoms of eye-strain, but "prefers to remain an agnostic rather than use unmeaning phraseology." [Dyspepsia, or the functional disorders of digestion, is undoubtedly a symptom in a small proportion of cases. Their number would unquestionably be larger if attention were directed to the eyes as a possible source of the trouble.]

Retinoscopy.—A committee was appointed by the Section on Ophthalmology by the American Medical Association at its forty-fifth annual meeting⁷ to determine the value of objective methods in estimating ametropia. It reported that they are of value in saving time, but cannot replace the subjective method with test letters and trial glasses. Randall,⁸ Würdeman,⁹

¹ N. Y. Med. Jour., July 13, 1894.

² N. Y. Med. Jour., vol. i., 14.

³ Loc. cit.

⁴ Jour. Am. Med. Assoc., Sept. 11, 1894.

⁵ Med. Rec., Jan. 13, 1894.

⁶ Am. Jour. Med. Sci., March, 1894.

⁷ Inter. Med. Mag., Nov., 1894.

⁸ Jour. Am. Med. Assoc., Sept. 1, 1894.

⁹ Ibid.

and Marlow¹ assert that retinoscopy is the most minutely exact measure at one's command. [Not all experienced ophthalmic surgeons will assent to this opinion.] Jackson² warns against the endeavor to determine the error of refraction without discriminating the pupillary from the peripheral zones of the cornea, which often differ materially in their curves, and advises that the diagnosis shall be made only by a study of the central or pupillary zones. This author gives a thorough exposition of the nature and application of retinoscopy in his monograph.

Myopia.—[Myopia is acquired or congenital. In infancy, the great majority of eyes are emmetropic or hyperopic, and a proportionally small number of children are born with myopia. By the excessive use of the accommodation necessary to obtain clear definition in hyperopia and hyperopic astigmatism, the anteroposterior axis of the ball is permanently elongated; thus oversight passes into near sight, and the stretching-process, having commenced in the sclera, is continued by near use of the eyes, increasing the degree of the myopia]. Marlow³ urges the necessity of early correction of hypermetropia and hyperopic astigmatism, especially the latter. Southard,⁴ considers it of greater importance than the later correction. According to Oliver⁵ myopia is also acquired by disease, such as iritis. Triepel⁶ claims that the vision of myopia is greater in proportion to the degree of defect than in the other forms of ametropia, on account of the functional capability of myopes of recognizing objects by circles of diffusion, aided by the psychical function, instead of by the optically true image.

EXTRACTION OR DISCUSSION OF THE LENS IN HIGH MYOPIA.—The operative treatment in high myopia has received considerable attention, and the almost universal judgment of those who have operated is in its favor in properly selected cases; Schanz⁷ sums up the results as described in the papers of Thier, Fukla, and Bergens, giving the number of cases operated upon with results. He strongly advocates this method in advancing myopia, or when the degree is so high that the near point is too close for practical work. Among those who commend the operation are Hori⁸ of Japan, Wray,⁹ Vacher,¹⁰ Fukala,¹¹ Bergens,¹² and Pflüger.¹³ Pflüger reports 30 cases, and fixes the grade which warrants the operation at 10 D. in children and 12 D. in adults. The age of the patient did not seem to influence the rapidity of absorption. There were 17 cases of 17 to 18 D., and 5 cases of 18.5 to 20 D. In all cases vision was improved, and in some cases doubled or

¹ Loc. cit.

² Jour. Am. Med. Assoc., Sept. 1, 1894.

³ Loc. cit.

⁴ The Refractionist, vol. i., p. 33, 1894.

⁵ Trans. Am. Ophthal. Soc., 1894.

⁶ Graefe's Arch. f. Aug., Bd. xl., Abth. v.

⁷ Arch. Ophthal., Bd. xli., Abt. i.

⁸ Arch. Augenh., Bd. xxxix., No. 2.

⁹ Med. Press, Feb. 19, 1895.

¹⁰ Arch. d'Ophthal., July, 1894.

¹¹ Arch. d'Ophthal., July, 1894.

¹² Klin. Monatsbl. f. Augenh., Feb., 1895.

¹³ Graefe's Arch. f. Augenh., Bd. xxix., 1894.

trebled. The three authors last named operate by discission. Manz¹ is opposed to the operation, except in chosen cases, on account of chronic inflammatory reaction.

Astigmatism.—Steiger² has closely analyzed the results of accurate investigations concerning astigmatism, its origin, nature, relation to the length of the eyeballs, etc., in about 5000 eyes. Among the many deductions he has made, a few may be noticed, but study of the tables and of the many interesting and statistical figures can alone give a correct impression of the great value of this work. Thus, the cornea is not a simple ellipsoid; the average astigmatism of 3170 eyes is 70 per cent. (70 out of 100 eyes were astigmatic); astigmatism is more frequent in girls than in boys; in two-thirds of all eyes astigmatism is between .50 and .75 D., in seven-eighths between .25 and 1.25 D.; as many eyes have 1 D. as have .25 D.; fewer girls have astigmatism under the average than boys; the average astigmatism of all eyes examined was .99 D.; astigmatism decreases in women at the fortieth, in men at the fiftieth year, and increases in old age; the cornea with high astigmatism changes little in the course of years, but eyes with .50–1.25 D. show an unmistakable tendency to lose their astigmatism or to make it reverse. Astigmatism, against the rule, is more common in age than youth and in men than in women, and may be considered as a continuation of a physiologic process of curvature; the degree of astigmatism is higher when there is a difference of degree between the two eyes; the cornea flattens in age and in greater degree in men; it is flattest in the new-born, and in old age is again flat; only 6 per cent. show an increase of astigmatism of 25 per cent. Important differences of the spherical refraction of both eyes, in the same individual, are due to axes-lengths. In eyes with unusual differences in the minimal corneal refraction, the cause is probably pathologic. Interpupillary distance increases during the period of growth and is greater in males than in females, the average being 61.3 mm., and varies from 53 to 71 mm. The average refraction of the cornea in males is 42.35 D., and in females 42.95 D. With increasing corneal curve the distance between pupils diminishes, and there is no fixed relation between interpupillary distance and body-size; the principal meridians are horizontal and vertical; among 832 eyes, the meridian of lowest curve is horizontal or within 10 degrees in 96.9 per cent., vertical in 8 per cent., and oblique in 3.5 per cent. The higher the astigmatism, the greater the deviation from horizontal and vertical, and the more irregular the axes, the greater the difference in the two eyes. The difference is so marked that there must be a causal relation between astigmatism and oblique axes. In high grades of astigmatism the difference between the two eyes is more frequent and of higher amount. The kind of astigmatism is dependent upon the refraction of the globe. In many eyes no

¹ Münsch. Med. Wochens., Dec. 18, 1894.

² Beit. z. Phys. Pathol. d. Hornhaut-Refraktion, i. Theil, Wiesbaden, 1895.

meridian can be considered normal. Heredity is the most prolific cause of astigmatism, for astigmatism of the father, as of the mother, descends to both boys and girls, and the position of the axes is also inherited.

OTHER CAUSES OF ASTIGMATISM BESIDES HEREDITY.—The influence of occupation on the production of astigmatism is shown by the analysis of the eyes of 33 artists by Howe.¹ He states that the radius of curvature in the vertical meridian was shorter than in the horizontal in a larger proportion of artists than of others, and attributes this to the pressure of the lids. Montgomery² is inclined to believe that the wearing of correction-lenses increases the astigmatism; in iritis, however, Oliver³ believes the increase of refraction is dependent upon the spastic tonicities of the fibers of the ciliary muscles or congestion with rigidity of the ciliary bodies.

Perry⁴ explains by photographing print as refracted by an astigmatic lens, the greater asthenopia and indistinctness of vision of individuals with astigmatism against the rule as compared with astigmatism according to the rule, since the latter can modify and correct to a certain extent the imperfect focusing of the dioptric media by partially closing the eyelids, producing the effect of a stenopaic slit, and not by changing the curvature of the cornea.

Marlow's⁵ ophthalmometric examinations convinced him that "while moderate and high degrees of astigmatism are mainly corneal, astigmatism of some degree (usually low) is present more frequently in the lens than in the cornea. [It should be remembered that astigmatism, both of the lens and cornea, is apparently greater while the eye under examination is under mydriasis than after the effects of the mydriatic have passed away.]

Marlow's figures of the frequency of the various errors of refraction in 2000 eyes are interesting for purposes of comparison:—

Simple hyperopia,	229,	16 per cent.,	or 11.4 per cent. in all the cases.
Simple hyperopic astigmatism, . . .	308,	21.5 "	" 15. " " "
Compound hyperopic astigmatism, . .	891, 625.	" "	" 45. " " "
Simple myopia,	19,	3.5 "	" 1.9 " " "
Simple myopic astigmatism,	156,	28.5 "	" 7.8 " " "
Compound myopic astigmatism, . .	252,	46. "	" 12.6 " " "
Mixed myopic astigmatism,	122,	22. "	" 6. " " "

The necessity of a mydriatic in estimating errors of refraction is admitted by careful ophthalmologists,⁶ and the unmitigated evil of indiscriminate selling of glasses by opticians and other irresponsible persons is strongly condemned by Gould⁷.

¹ Am. Jour. Ophthal., Sept., 1894.

² Jour. Am. Med. Assoc., Nov. 17, 1894.

³ Loc. cit.

⁴ Ophthal. Rec., Feb., 1895.

⁵ Loc. cit.

⁶ Jennings, Jour. Am. Med. Ass., June 23, 1894.

⁷ Med. News, Nov. 24, 1894.

DISEASES OF THE LIDS, ETC.

Blepharitis.—Hydrogen dioxid is recommended by Ayers ¹ in the treatment of marginal blepharitis. He first removes the crusts, instills cocain, and applies the remedy by rubbing it along the edge of the lid with a little cotton wrapped on the end of a Japanese toothpick. While not a specific, he has had excellent results from this simple procedure. The most important factor in the cure, as Clark ² has reemphasized, is the correction of the optical defects.

Tumors of the Lid.—In the diagnosis of tumors of the lid De Schweinitz ³ calls attention to the resemblance of epithelioma to ulcerated Meibomian cyst.

Lesuiowski ⁴ reports the case of a young man of twenty who, after having a sty on the lower lid of the right eye for several days, was suddenly seized with a chill, followed immediately by a marked edema of the forehead. He grew continually worse, had intense fever, loss of consciousness, and the edema extended from the lid to the forehead and left half of the cranium. The eye-ball seemed normal. The course of the epicranial veins could be traced in red streaks, in some of which fluctuation could be found on palpitation, while others felt like hard cords. Incision yielded a yellow, thick, nonfetid pus. The wounds were thoroughly irrigated and dressed, but in spite of active treatment the patient died. The autopsy revealed suppuration of the two cavernous sinuses while the other cerebral sinuses contained liquid blood. The ophthalmic vein was filled with pus, and one of the suppurating veins could be traced to the sty. Cultures from the pus, obtained at the time of the operation, revealed the yellow pyogenic staphylococcus.

A melanoma of the lids is reported by Wilmer, ⁵ which was dissected out and found to consist of strong bands of connective tissue, masses of black pigmented giant-cells embedded in islands of myxomatous tissues, large, round, spindle, and stellate cells, and high vascularity. No recurrence took place in a year. Other cases of tumor of the lids are :—A gumma by Snell ; ⁶ an osteoma by Hartridge ; ⁷ another by Galtier ; ⁸ three cases of epithelioma, in two of which skin-grafting was successfully employed (one year and six months respectively) ; De Schweinitz, ⁹ Keyser, ¹⁰ Braquehay, and Soudille, ¹¹ describe a variety of tumor having some of the characteristics of an osteoma, and that histologically presented lobulated or tubulated pavement-epithelium, the cells of which were infiltrated with fine calcareous granules.

Dunn ¹² reports a case of congenital fistula of the lacrymal sac, in which

¹ Med. News.

² Trans. Am. Oph. Soc., May, 1894.

³ Trans. Am. Oph. Soc., May, 1894.

⁴ Brit. Med. Jour., Dec. 22, 1894.

⁵ Trans. Am. Oph. Soc., 1894.

⁶ Arch. d Ophthal., Feb., 1895.

⁷ Brit. Med. Jour., Sept. 15, 1894.

⁸ Ann. d'Oculist., Jan., 1895.

⁹ Brit. Med. Jour., Nov. 24, 1894.

¹⁰ Ann. d'Oculist., March, 1895.

¹¹ Jour. Am. Med. Assoc., Sept. 1, 1894.

¹² Arch. Oph., April, 1895.

the opening was a slit $11\frac{1}{2}$ mm. in length, parallel with the canaliculus. A probe could be passed directly into the sac. The fistula did not communicate directly with the canaliculus. The condition was not the result of inflammation or operation.

DISEASES OF THE LACRYMAL APPARATUS.

Diseases of the Lacrymal Gland.—Tubercle as a cause of slowly-growing tumor of the lacrymal gland without inflammatory changes is described with microscopic findings by Salzeil and Baas.¹

TRACHOMA OF THE LACRYMAL GLAND, an infrequent disease, has been studied by Baguis,² who collected 38 cases of symmetric disease of both glands, and adds one new case involving both glands. He extirpated one, the other atrophied under treatment. Anatomic examination showed connective-tissue growth, and the vessels altered by periarteritis; around the atrophied glands and acini were collections of endothelial cells, protoplasm with nuclei, true trachoma-granules, the central part consisting of endothelial, polygonal, flattened cells. The process originated in the lymph-vessels surrounding the gland—"a periadenitis ascendens."

Diseases of the Excretory Apparatus.—Nasal disease is an important factor in the causation of lacrymal obstruction and must be considered in the treatment. Guenod³ gives in detail two cases of lacrymal abscess in ozænous patients, the pus from which developed pure cultures of the bacteria of Loewenberg. Inoculation of rabbits' corneæ with the cultures produced purulent inflammation. Alaino⁴ believes that the majority of such patients are the subjects of syphilis and scrofula.

In an obstinate case of dacryocystitis in a sensitive woman of advanced years reported by Leplat,⁵ a number of ineffectual attempts were made to pass a No. 2 Bowman probe and to irrigate the canal with alum acetate 3:100. Later in the day the woman complained of great weakness and violent pain in the head, especially on the left side. There was marked tumefaction of the left side of the face limited by the median line. The eye was fixed but only slightly swollen, and there was nausea but no vomiting. Some days later, however, after having severe pain in the head, the symptoms of meningitis presented themselves in full force and coma was followed by death. The absence of orbital cellulitis renders this case unusual, and the author gives it as his opinion that germs escaped from the lacrymal passages through abrasions produced by the probe or cannula, and were disseminated by the solution and found their way to the meninges by means of the veins.

¹ Arch. Oph., Jan., 1895.

² Annal. di ottal., Fasc. 3-4, 1895.

³ Arch. d'Oph., Aug., 1894.

⁴ Arch. de Ottamol., vol. i., Fasc. 5-9, 1893-4.

⁵ Recueil d'Ophthalmologie, Nov., 1894.

In epiphora Brettremont proposes repeated cauterization ¹ of the orifices of the ducts in the upper culdesac as a substitute for removal of the gland, which, he thinks, eventually atrophies.

Elschnig ² reports a case of actinomyces in the nasal sac which was cured by extirpation.

DISEASES OF THE ORBIT.

Tumors.—Study of the literature and clinical investigation combined with microscopic examination of two private cases induce Mitvalsky³ to believe that many osseous growths originate in the frontal sinus, and, through thickening and disease of the mucous membrane, gradually induce inflammation of the bone and the tumors. In deciding whether operative interference shall be attempted, we must consider the relation of the osteoma to the frontal sinus, the pathologic process, the final result of the tumor-growth if undisturbed, and, as reported by Berlin, the high percentage (25) of deaths. Empyema offers a decided obstacle to the diagnosis. Martin⁴ proposes the employment of an intracranial catheter. Snell⁵ four years ago removed a bony tumor the size of a pigeon's egg from the internal angle of the orbit. There was no recurrence.

Harlan⁶ (see Plate 25) reports the following cases:—One of epithelioma, removed, and recurring in three months; one of sarcoma, completely filling the orbit, with evisceration, and without recurrence; one of sarcoma in a child of nine, with evisceration and recurrence in one month, followed by death in three months. In the management of malignant growths Darier⁷ recommends, early in their history, the galvanocautery, chromic acid or a concentrated solution of methyl blue by application to the surface, or, when voluminous, injection into the interior.

Congenital Syphilis of the Orbit is an exceedingly rare disease. Walter⁸ had the opportunity to examine microscopically a double-sided tumor, that, in a child three and a half years old, caused increasing exophthalmos, necrosis, and collapse of the corneas of each ball. Around the eyes could be felt a hard tumor, that rapidly involved the bones of the cheek, forehead, and temple. The child lost flesh and died. The tumors consisted of reticular connective tissue containing lymphoid cells whose nuclei were violently colored by hematoxylin. The diagnosis of gunma was verified. Boerma⁹ describes another rare orbital affection, or rather the appearance in the orbit of general disease of the lymph-system. His case showed symmetrically-placed lymphomata in each orbit and multiple tumors of a similar

¹ Le Progres méd., Dec., 1893.

³ Arch. d'Oph., Oct., 1894.

⁵ Ann. d'Oculist., July, 1894.

⁷ Arch. d'Oph., July, 1894.

² Klin. Monatsbl. f. Augenh., June, 1895.

⁴ Arch. d'Oph., July, 1894.

⁶ Trans. Am. Oph. Soc., May, 1894.

⁸ Klin. Monatsbl. f. Augenh., Jan., 1895.

⁹ Graefe's Arch. f. Oph., Bd. xl., Abt. 4, 1894.

PLATE XXV.



Epithelioma of the orbit (Harlan)
Trans. Am. Oph. Soc., May 18, 1910.

nature all over the body. Those in the orbits were removed, and up to the time of writing did not recur.

Rabinowitsch¹ reports a case of echinococcus in a woman sixty-four years old. The growth was rapid; the cyst-wall consisted of a fibrous sac grown fast to the ball and surrounding tissue; the contents were an opalescent fluid containing the worm. Lawford's² case recovered after incision permitting the escape of clear fluid. Eagleton³ made a pardonable error in diagnosis. The tumor was thought to be sebaceous, but, during removal, was discovered to be dermoid in character and connected to the globe and orbital fat by a pedicle. "In dermoids the skin is attached to the tumor, in sebaceous growths it is freely movable. The latter are easily enucleated; the former with difficulty." In Ferson's⁴ case from 15 to 20 grains of an absolutely transparent and colorless fluid were removed, and a visual acuity of but $\frac{1}{20}$ was restored the next day to $\frac{1}{2}$. Two years later the tumor suddenly reappeared. An incision was made, the sac was thoroughly curetted, and as much as possible of its wall excised. A number of hydatid vesicles and a large quantity of membranous debris were removed, and the sac was thoroughly irrigated with mercuric chlorid 1 : 2000. After some reaction-recovery followed and vision returned to almost normal. Campbell⁵ found in a native of Egypt a large rounded tumor completely concealing the right orbit. A trace of the palpebral slit without eye-lashes was detected at the lower margin of the tumor, and the opinion was formed that the case was one of complete ankyloblepharon with retained and probably semipurulent lacrymal secretion; this was found to be correct.

Cellulitis.—May⁶ describes a case of cellulitis following operation for squint, in which the only cause was infection by ice-compresses. The patient recovered with partial atrophy of the optic nerve and good central vision. Stephenson⁷ reports a case of infection following Mules' operation for insertion of a glass vitreous. For cellulitis, Godfrey⁸ recommends repeated painting of the skin of the orbit with a 5 per cent. solution of silver nitrate, boric acid dressing and roller pressure-bandage. Lawson⁹ advises free incision through the upper lid. Taylor¹⁰ reports a case of probable involvement of the lenticular ganglion in orbital cellulitis, in which the signs simulated glaucoma. The pupil was farther dilated to 9 mm. by cocain and homatropin, and to a less extent by faradism applied to the neck.

The causes of orbital phlegmon are various, and are, in general, to be referred to disease exterior to the orbital walls. Hersch¹¹ reports three cases, the first the result of having a tooth drawn, the second from syphilitic nose-

¹ Centralbl. f. prak. Augenh., Dec., 1894.

² Brit. Med. Jour., Dec. 22, 1894.

³ Codex Medicus, Dec., 1894.

⁴ Ann. d'Oculist, Feb., 1895.

⁵ Lancet, No. 3716, p. 1159. Ref. Am. Jour. Med. Sci., Jan., 1895.

⁶ Trans. Am. Oph. Soc., July, 1894.

⁷ Brit. Med. Jour., Sept. 15, 1894.

⁸ Med. Rec., Nov. 3, 1894.

⁹ Brit. Med. Jour., Dec. 22, 1894.

¹⁰ Oph. Rev., Sept., 1894.

¹¹ Int. Klin. Rundsch., Sept., 1894.

disease, and the third from abscesses of the ear and other parts of the body through metastasis. The eye was lost in each. The symptoms are illustrated in a case reported by Mertz.¹ The cause was supposed to be two carious teeth. An abscess in the antrum formed, extending through the floor of the orbit. There was exophthalmos, limited movement, papillitis, amblyopia, a purulent and stinking discharge through a fistula in the upper lid, and a mucocele protruding from the conjunctiva. Panas² reports a case of similar origin, in which the abscess of the antrum extended to the orbit, thence, by perforating the roof, infected the frontal lobe, producing death. In Spalding's case³ the disease originated in the alveolar process, which became necrosed from constant exposure to the action of fumes of phosphorus. There was extensive disease of the antrum, purulent infiltration of the orbit, causing enormous exophthalmos, necrosis of the orbit and wall of the antrum, atrophy of the nerve, exhaustion, and death. De Schweinitz⁴ reports a case of bilateral exophthalmos with hemorrhagic neuroretinitis from traumatic intracranial arteriovenous aneurysm.

The contribution of Morton⁵ upon the subject of fracture of the wall and margin of the orbit is valuable from the ophthalmic standpoint, the subject having been relegated largely to the surgeon. Fracture of the roof may occur from force directly or indirectly applied to the orbital arch or to the frontal region. A body striking the roof nearly always passes into the anterior cerebral lobe, but if not striking perpendicularly, it is often turned into the apex. Linear fracture at that point where it bends on itself may arise from a blow on the orbital margin, when it will often involve the frontal sinus. Fracture of the roof may occur from violent blows or falls on the frontal region. The orbital plates seem to be the focus for this region, as the petrous bones are for the middle fossæ. Accompanying and diagnostic symptoms are ecchymosis of the conjunctiva and exophthalmos; sudden incurable blindness—a strong evidence of fracture of the roof, passing through the optic foramen—and emphysema of the lids and orbit. In penetrating fractures there is usually injury to the orbital contents. Cerebral symptoms may follow from hemorrhage or inflammation. Von Holden has shown that out of 126 cases of fractured skulls 86 were fractures of the base, and in 79 cases it involved the optic foramen. Fractures may elude detection, postmortem, unless the dura is stripped off. Baguis⁶ gives an illustrative case, in which a boy of eleven had an indirect fracture of the orbital roof of one side in consequence of a fall. He suffered a moderate exophthalmos, dislocation of the ball downward, and after two days palpebral ecchymosis. The diagnosis rested on the extraction of blood by means of a syringe from behind the ball.

¹ Klin. Monatsbl. f. Augenh., Feb., 1895.

² Arch. d'Oph., Mar., 1895.

³ Ibid., Jan., 1895.

⁴ Int. Med. Mag., vol. iv., No. 1.

⁵ N. Y. Med. Jour., Mar. 16, 1895.

⁶ Arch. di Ottal., vol. i., 1893, '94, Fasc. 5-9, Ref., Centralbl. f. Prakt. Augenh.

Traumatic Paralysis of the Ocular Muscles.—Panas,¹ in a study of two cases of this condition, due to fracture of the skull, draws four conclusions: 1. The majority of ocular paralyses from traumatism to the skull arise from fracture at the base; 2. The character of the injury does not necessarily exclude basal lesions; 3. The sixth pair, from its intimate relation to the bone, is most frequently affected; 4. The compression may be due either to bone or blood; if to the former, paralysis supervenes at once; if to the latter, some time elapses. Lawson² calls attention to a symptom prominent in most cases, namely, a very high temperature, ranging from 101° to 107°. He believes that in most cases, especially in women, the cause is septicemia from infection through the genital tract, and that many of the so-called rheumatic cases are really pyemia or septicemia. Unless relief is soon obtained by incision, free drainage, and antiseptics, the patient dies. Culbertson³ reports a case of unilateral facial and orbital edema and exophthalmos of sudden onset, following exposure, in a patient with a syphilitic history. He had complained for about ten days of pain in the lumbar region, probably of nephritic origin. Johnson⁴ describes four unfortunate and unusual cases; in one a dead cherry-branch $2\frac{3}{4}$ by $\frac{1}{4}$ inches penetrated the upper lid and became hidden from view; in three months after removal vision was $\frac{6}{200}$. In the second a piece of pine wood $2\frac{3}{4}$ by $\frac{3}{4}$ inches entered the orbit below the ball, and although removed, death ensued in three months from meningitis. In the third case a similar injury from a smaller piece was followed by recovery, and in the fourth case one eye was destroyed by the premature explosion of a cannon that drove weeds, stubble, and powder in the right eye and into both orbits, also injuring the left eye.

ANOMALIES OF THE OCULAR MUSCLES.

[A large amount of material has been published during the year, mostly clinical in character, treating of both functional and organic disturbances of equilibrium. The terminology of Stevens has been generally followed by Americans and ignored by European writers.]

The Position of Rest.—Hansen Grut⁵ presents concisely acceptable views on the position of rest. The anatomic position of rest is more or less divergent, rarely parallel, and hardly ever convergent. In other words, it is the zero-point of convergence. The functional position of rest is parallelism. A certain amount of practice is necessary in hyperopia to maintain the relation of accommodation and convergence in reference to the functional position of rest. Under the covering hand convergence is common in hyperopia, but that convergence is not the position of

¹ Arch. d'Oph., Aug., 1894.

² Oph. Rev., Jan., 1895.

³ Am. Jour. Oph., Aug., 1894.

⁴ Trans. Am. Oph. Soc., 1894.

⁵ Arch. f. Oph., Jan., 1895.

rest is proved by its correction under glasses. Further, habit or unconscious innervation maintains parallelism. In permanent convergent strabismus the squint is the functional position of rest, and the squint increases during accommodation. Convergent squint is the result of an actual innervation of the interni; divergent squint is a passive process.

Four conclusions reached by Hansell¹ are: 1. Amblyopia is congenital and not acquired; is not improved by tenotomy when high or of long duration; is always present in monocular squint; is not a factor in alternating squint; can be replaced by full acuity of vision after the hitherto good eye has been rendered by accident or disease inferior to the squinting eye. 2. In monocular constant squint the cornea of the squinting eye is turned upward as well as inward. 3. In concomitant or alternating squint, the nonfixing eye is turned upward as well as inward, and with transference of fixation there will be a transference of both the upward and the inward deviation. 4. Donder's theory, extended to include all the muscles supplied by the third nerve, and not the interni alone, is a sufficiently satisfactory explanation of the upward deviation. Johnson² reports the history of a case of a young man of nineteen, cross-eyed since three years of age, and highly amblyopic in the squinting left eye since his earliest recollection, who, on losing by an accident the right eye, learned to use the left. The vision increased from counting fingers at 6 m. to $\frac{6}{6}$ with + 1.25 D. [This case, as the author points out, establishes beyond doubt that amblyopia may be due to suppression of the visual image with no disease of the eye or brain].

It is the rule, according to Alfred Graefe,³ in muscular equilibrium for convergence to be equal in both eyes, even when accommodation and clear vision are not factors in producing fusion. Risley⁴ believes muscular asthenopia frequently depends on the relation of adduction and abduction, which should be as three to one, and the cause of a want of equilibrium is to be sought in muscular weakness, neurasthenia, and errors of refraction. He agrees with Valk⁵ and with Bernstein⁶ that errors of refraction should be corrected and the glasses worn at least a month before treatment is directed especially to the muscles. Insufficiency of the interni was present in 50 per cent. of Valk's 100 cases of asthenopia. He relies, however, on the prism test for the diagnosis, to the exclusion of the Maddox rod and other tests, which have for their purpose the altered image of the test-light on the fovea [and falls into error when he speaks of the strength of individual muscles estimated in this manner]. Hale⁷ justly refers the cause of muscular asthenopia in exophoria to nervous or central origin, as advocated by Gould.

¹ Jour. Am. Med. Assoc., Feb. 16, 1895.

³ Graefe's Arch. f. Oph., Bd. xl., Abt. v., 1894.

⁵ Med. Rec., July 21, 1894.

² The Oph. Rec., Nov., 1894.

⁴ Univ. Med. Mag., Jan., 1895.

⁶ Trans. Am. Oph. Soc., 1894.

⁷ Ibid.

Hobby¹ calls attention very properly, in view of the innervational theory of squint, to a conception that he believes to be an error, in the minds of many, regarding the action of prisms. In disciplining or training the coordinative impulse they may be of value, but they add nothing to the resistance to muscular contraction in the sense that the dumb-bell does when used in gymnastics. Duane² claims that the method of treating exophoria, as suggested by Gould,³ by innervational gymnastic exercises by prisms, is not a new one, having practised it himself for eight years; that the theory of innervation, on which it is based, applies only to those cases in which the accommodation and convergence are associated in every contraction of either; that exophoria remains, although the power of adduction as expressed in overcoming prisms has been increased by exercise. Some cases can be cured by exercise, others by tenotomy, others by correction of the error of refraction, and others are incorrigible. Morton⁴ reports 3 cases of esophoria and 1 of exophoria entirely relieved of severe asthenopia by Gould's method of rhythmic exercise after other means had failed.

Valk⁵ asserts that amblyopia is a temporary suspension of vision due to a want of development of the retinal elements and is not central. [His arguments are based on his belief in the excessive strength of the interni and seem to us illogical.] He declares amblyopia is the cause of the convergence and cannot be cured. The absence of diplopia in squint, according to Schmidt-Rimpler,⁶ is due not so much to suppression of the image of the defective eye as to the better image on the macular region of the fixing eye. Binocular vision is not always obtained by tenotomy, although fusion may be developed by stereopticon exercises. On the other hand, Coleman⁷ attempts to prove, because vision may be improved after tenotomy, that amblyopia is acquired and not congenital. [The improvement does not hold in all cases, and, unless binocular fixation is given by operation, it is the result of better correction of ametropia. It seldom equals or approaches the vision of the better eye.] Hirschberg⁸ calls attention to an important diagnostic point. He says that in alternating squint the fixing eye maintains fixation only as far as 20 degrees to the same side, when if the object is carried still farther to that side, fixation is suddenly shifted to the other eye. Thomas⁹ and Harvey¹⁰ report four cases of crossed diplopia in internal and homonymous diplopia in external squint. Thomas's conclusion that two fixation points existed is plausible and must be accepted in lieu of a better explanation, but Harvey claims to have cured a divergent squint by exercise of weak adduction by means of a prism 12 degrees, base in. The evidence of a second

¹ Ann. of Oph. and Otol., 1894.

² Ann. of Ophthal., July, 1894.

³ Med. News, Feb. 3, 1894.

⁴ Oph. Rec., vol. iii., 1894.

⁵ Med. Rec., Nov. 24, 1894.

⁶ Deutsch. Med. Wochens., Nov. 1, 1894.

⁷ Ann. Oph. and Otol., April, 1895.

⁸ Centralbl. f. prakt. Augenh., July, 1894.

⁹ Trans. Am. Ophthal. Soc., 1894.

¹⁰ Arch. Oph., April, 1895.

fixation spot rests on homonymous diplopia of 3 degrees for far and 6 degrees for near vision. [We feel inclined to criticise the study of this case and can hardly accept the conclusions.]

Oppenheimer¹ reports 28 cases of asthenopia from insufficiency of the internal recti muscles, even though the general health was fairly good and refraction-errors were corrected. Instead of general tonics, graduated tenotomies, or gymnastic exercises of the weakened muscles, he tried the use of gradually increasing doses of strychnin. The eye-symptoms disappeared and the patients were able to use their eyes with comfort. He thinks strychnin has a specific action on the interni and is contraindicated in esophoria.

Thomas² strongly advocates graduated tenotomy in heterophoria.

Schweigger's³ criticisms on tenotomy are particularly valuable, since they are the results of many years of observation by an eminent authority. The result of the tenotomy in 25 patients with normal binocular vision and measurable deviation of the images was, after years, unsatisfactory. Diminution of vision, congenital or not, is one of the causes of permanent as well as periodic squint. In a majority of cases periodic squint is removed by simple tenotomy. The imperfect results of tenotomy are in the squinting eye only, and in fact in all cases of amblyopia. Gymnastic exercise of the muscles by alternately turning the eyes to the right and left is a useful preliminary to the operation for squint. In high divergent periodic squint, when the position of the eye is seldom correct, it is better to advance the internus, because the general result of tenotomizing the externus is zero. Operation (tenotomy) is limited to the cases in which the facultative divergence is greater than normal. The result of insufficiency in divergence by advancing the internus alone, without tenotomy of the externus, is generally transitory. Vertical deviation occurs most often with lateral deviation, and disappears after the lateral is corrected. In this connection the experiences of Landolt⁴ are worthy of careful attention. He stated that the results of his experience in the surgical treatment of strabismus during a period of more than twenty years might be summed up in a few words: "The incomparable superiority of the advancement of the muscle over its setting back." It is his practice to make advancement the rule and simple tenotomy the exception, reserving the latter as a means of supplementing the former in extreme cases. And for this he claims the great advantage that on the side of the advanced muscle, the movement of the eye is always increased without anything being lost on the side of the antagonist. The rather full discussion that followed brought out very clearly the fact that the majority of the speakers, while resorting to advancement in certain cases, still adhere in the main to the rules laid down by Von Graefe.

¹ Am. Med.-Sur. Bull., Mar. 15, 1895.

² Med. and Surg. Report., Aug. 11, 1894.

³ Arch. f. Oph., Jan., 1895.

⁴ Eighth Internat. Ophthal. Cong., Edinburgh, Aug., 1894. Arch. d'Ophthal., Mar., 1895.

Landolt¹ considers the results of operative treatment as only cosmetic when one eye is amblyopic. His reasons are scientific and forcible. In a detailed study of several cases, he demonstrates that it is possible by the operation advised, supplemented by stereoscopic exercise, to obtain practically perfect binocular vision both for the far and near point, with good adduction in cases in which there has been marked divergence or convergence. [The method is far more tedious than simple tenotomy, but, if such results as Dr. Landolt describes can be obtained, the additional time and effort would be well expended. In listening to the discussion that followed the reading of Landolt's Edinburgh paper, it was evident that few of those who took part were in the habit of giving the minute and detailed study to each case of strabismus that such cases would warrant, if one has as his object to satisfy his own critical judgment rather than to obtain a result sufficient to satisfy the patient and his friends. Certainly nothing but good is likely to follow if Dr. Landolt's method is given a conscientious trial. Since the muscles are individually not responsible for strabismus when there is no paralysis, the question of which muscle to tenotomize should not rise.]

Stevens² justly insists, in strabismus-operations in hyperopia, that each eye must be considered equally guilty, and the operation divided between the two eyes.

Among the new tests that have been suggested for heterophoria, that of Duane is worthy of confidence.³ The patient looks at a candle-flame or white spot on a dark background at twenty feet away. The eyes are alternately covered and uncovered. In orthophoria no movement of the light is seen; in heterophoria it will be seen to jump from a false to the true place. Thus in esophoria its movement is homonymous, in exophoria crossed, in hyperphoria upward or downward. The degree of the tendency to deviate can be readily measured by prisms, even 0.5 degree, by placing the prisms according to the condition. Duane claims accurate, consistent, and unfailling results and, after eight years' experience, considers the test better than any other.

Savage's theory of the harmonious nonsymmetrical action of the oblique muscles in astigmatism is approved by Price⁴ and opposed by Hotz,⁵ who demonstrates experimentally that this supposed action is untenable. Refractive defects cause blurred images, but not malposition of these images. [It is therefore evident that neither experiments nor clinical observations nor the laws of physiologic optics sustain the doctrine of the obliquity of the retinal images and the necessity of any action of the oblique muscles in oblique astigmatism]. Wilson substitutes for Savage's theory a modification, namely, that this action depends in some cases on the action of the superior, in others of

¹ Arch. d'Ophthal., Aug., 1894.

² Brit. Med. Jour., Sept. 15, 1894.

³ Arch. Oph., April, 1895.

⁴ Jour. Am. Med. Assoc., Sept. 8, 1894.

⁵ Ann. of Oph. and Otol., April, 1895.

the inferior oblique ; the amount and character of the astigmatism ; the nature of the ametropia ; of the object and the action of the ciliary muscle. The relation of the accommodation to muscular defects is negatively demonstrated by four cases of Theobald,¹ who concludes that subnormal accommodative power is found with from three to five degrees of exophoria, which Theobald considers normal. In a series of carefully conducted experiments Sattler² tested Schoeler's theory of the lengthening of the optic axes and increased amplitude of accommodation in aphakia during convergence and found it wanting.

Paralytic Affections of the Ocular Muscles.—An experimental demonstration of the rotation of the ball is given by Eaton.³ By piercing a small rubber ball with two needles—horizontal and vertical—and rotating the ball to correspond with the rotation of the eye by the various muscles, singly and in combination, he shows that in some cases the vertical meridian, as stated by Donders and others who have copied from him, is not limited as indicated, and refers to Listing and Fick's accurate statements as to their correct turning. He quotes Listing thus: "When the visual line passes from the primary position to any other position the angle of torsion of the eye in its second position is the same as if the eye had come to this second position by turning about a fixed axis perpendicular both to the first and second position of the visual line."

Rules for determining clinically the muscles affected in paralysis are thus given by Landolt⁴: "The affected eye is that in the direction of the image of which the diplopia increases. The paralyzed muscle is the one which would have given the position and direction of the false image. The direction of the patient's head corresponds in every way to the physiologic action of the paralyzed muscle."

Traumatism as a cause of paralysis of the abducens is made the subject of an exhaustive article by Purtscher,⁵ who gives an analytic study of the causes of traumatic paralysis of the external rectus. Of a total of 48 cases 2 were due to direct injury, 33 to unilateral paralysis, and 13 to bilateral when the lesion was intracranial. Postmortems were made in 11, the fatal cases. In 6 the paralysis was secondary from abscess, induration, and neoplasm. In the primary cases the most frequent lesion was fracture of the petrous portion of the temporal bone, fracture of the base in 16 and very probably in 16 more. Direct division of the nerve-trunk is to be considered the most important lesion. Purtscher calls attention to the following points: the frequency of bilateral paralysis, 28.3 per cent.; the dependence of the line of fissures on the line of force, and the secondary importance of the anatomic arrangement of the bones; the fact that in 11 of the 14 cases of unilateral paralysis in which the force was

¹ Trans. Am. Ophthal. Soc., 1894.

² Graefe's Arch. vol. xl., Abth. 3.

³ Ann. of Oph. and Otol., April, 1895.

⁴ 63d Ann. Meet. Brit. Med. Assoc., 1894.

⁵ Arch. of Ophthal., Oct., 1894.

lateral the affection was on the side of the force, the relative frequency of primary paralysis without other cerebral symptoms, and to the intense and rapidly-developing contraction of the opposite muscle.

To this collection the case is added by Green¹ of a boy of ten, who was thrown from his horse, struck his left side, and was picked up unconscious. The external rectus of the left eye was paralyzed. The patient was treated by potassium iodid and recovered in five weeks. We also have a report of two cases by Roy,² in which the causes were respectively malaria and traumatism. In the latter the value of instrumental gymnastic exercise is emphasized. Another case is that of Friedenwald,³ in which direct lateral fracture of the skull produced paralysis of both abducens and the fifth pair, and finally one by Zimmerman,⁴ in which a man was struck on the left side midway between the external auditory meatus and the occipital protuberance. The blow was followed by unconsciousness, vomiting, and hemorrhage from the left meatus. The day following there were homonymous diplopia and secondary contraction of the internus from complete paralysis of the external rectus of the same side, which became permanent. The lesion was probably a horizontal fracture of the apex of the petrous bone, since no other cranial nerve was affected. The left membrana tympani had been ruptured.

Diphtheria as a Cause of Internal and External Ocular Paralysis is illustrated by the case of Priestley,⁵ in which there was dilatation of the pupil. The patient recovered. In the *Lancet*⁶ is a note of a case of paralysis of the ocular muscles from diphtheria of the genitals, followed by death. Heintz⁷ had a case of bilateral paralysis of the abducens following diphtheria, and Green⁸ reports a case in which the eye-complication followed six weeks after a mild attack of diphtheria.

Schmidt-Rimpler⁹ tried antitoxin in three cases—two of true diphtheria with difficulty in swallowing. In the third week of the disease, Acc. = 5.5 D. On the eighth day after an injection into the breast of a flask (Pravaz) full of serum, Acc. = 10.5 D., and there was no regurgitation. In the second case the symptoms were the same as in the first case, with the addition of internal strabismus, H. = 2.5 D. and 2 D. The left eye was amblyopic. (The squint had no connection with the diphtheria.) Acc. R. 7.5 D. In nine days after treatment by injection, Acc. = 12.5 D., and there was normal swallowing. In the third case, in sixteen days after the injection, Acc. = 9 D. (This patient had been treated by other means unavailingly.)

Recurrent Paralysis of the Oculomotor Nerve.—In all 28 cases have been reported.¹⁰ The importance of these reports lies in the postmortem find-

¹ Ann. of Ophthalm., July, 1894.

² Ann. of Ophthalm. and Otol., Oct., 1894.

³ Arch. of Oph., Oct., 1894.

⁴ Arch. Oph., April, 1895.

⁵ Med. News, Aug. 14, 1895.

⁶ May 28, 1894.

⁷ Centralbl. f. prakt. Augenh., Feb., 1895.

⁸ Ann. of Ophthalm. and Otol., July, 1894.

⁹ Centralbl. f. prakt. Augenh., Dec., 1894.

¹⁰ Jack, Bost. Med. and Surg. Jour., Dec. 21, 1893.

ings. In one of Jack's cases the patient died in the fourth attack ; there was exudation around the right motor oculi along its course at the base, and a blood-clot in the pons. In another the third nerve as it left the peduncle was flattened, grayish, and covered with numerous granulations that contained tubercle bacilli. In another the right motor oculi as it passed through the dura was gray and club-shaped because of a fibrochondroma that had separated the fibers of the nerve, but had not destroyed them. In all the nuclei were healthy and the lesion basilar.

Philip Coombs Knapp¹ gives the report of a monocular case complicated with anesthesia in the skin, supplied by the first two branches of the fifth nerve, and a table of 39 cases hitherto reported. Parenteau's² first case was one of monocular third-nerve paralysis once yearly for eleven years, lasting one or two weeks, preceding or following menstruation, and accompanied by weakness and abdominal pain. His second case was in a male of sixteen, with total paralysis of the third nerve of the right eye every three months for eight years, attended with malaise and vomiting. Full recovery followed each time. $V. = \frac{2}{3}$, with + 1.75 D.

Sundry Paralysis.—Hanke³ describes a case illustrative of a lesion supposed to be in the nuclei of the third and seventh nerve and ganglion cells lying between them, probably congenital, at least in part so. A young woman, mother of 4 children, complained of dizziness, stupor, and nausea for seven months, commencing one month after her last confinement. She had ptosis, immobility of eyes upward, inability to close the lids, concentric limitation of the fields, exophthalmos and loss of smell, an ulcer in the left cornea, chemosis, and protruding conjunctiva. A rare sequence of traumatism is mentioned by Vossius⁴ in a young man who received a blow on the under lid of the left eye with a blunt lance. Immediately all ocular muscles, internal and external, were paralyzed, and vision reduced to $\frac{2}{50}$. The function was reestablished in six months. The probable cause was a hemorrhage in the orbit. Acute and curable cases of ophthalmoplegia are unusual. Hoche⁵ reports a case that commenced with double-sided ptosis and advanced to complete paralysis of all the external muscles, partially dilated pupil, and preservation of the accommodation, of eighteen months' duration. The patient recovered under treatment by galvanism and potassium iodid. Gradle⁶ furnishes 3 illustrative cases of paralysis of the ocular nerve fibers, in which the symptoms were slight narrowing of the commissure, pupillary contraction, hyperemia of the skin of the lids and conjunctiva, and congestion of the retinal vessels. The paralysis may be caused by tumors, enlarged glands, and injuries, and in many cases there is no assignable cause. The disease is incurable, but leads to no secondary changes. The association of paralysis of the sym-

¹ Bost. Med. and Surg. Jour., Sept. 27, 1894.

² Rec. d'Ophthal., July, 1894.

³ Wien. klin. Woch., Nov. 15, 1894.

⁴ Beit. z. Augenh., Hft. 16, Nov. 27, 1894.

⁵ Berl. klin. Woch., Aug. 27, 1894.

⁶ Trans. Am. Oph. Soc., July, 1894.

pathetic and paralysis of the cerebrospinal system is demonstrated in the report of a case of Herpes Zoster Frontalis with Neuroparalytic Keratitis and Oculomotor Paresis, by Ginsberg.¹

Nystagmus.—The movements of the eyes may be lateral, vertical, rotatory, mixed, and of a peculiar variety present only in blind eyes—movement in one sweep over to one side, returning in a series of short jerks. The movements are binocular and conjugate. The causes are congenital, acquired from defective vision, from exhaustion of the muscles, and from nervous disease; in children, intrauterine chorioretinitis, albinism, congenital cataract, and infantile ophthalmia. Under the third group of causes is included the nystagmus of miners. Neiden² endorses the opinion commonly held, that the nystagmus of miners is caused by the constant strain of looking upward necessary to their work. Sym³ advises that if nystagmus threatens, an operation be performed at once in cases of nebula of the cornea and of congenital cataract. The nervous affections in which ocular coordination is wanting are disseminated sclerosis, cerebellar diseases, retrobulbar neuritis, and optic atrophy.

The Hemiopic Pupil Reaction (Wernicke's symptom) is of value in the diagnosis of cerebral disease. According to Henschen,⁴ the reaction is absent in softening of the occipital, parietal, and temporal lobes, even when extensive; in lesions of the outer corpus geniculatum, of the pulvinar, and of the posterior corpora quadrigemina, and present in lesions of the tract, even when minute, of the posterior segment of the thalamus and pulvinar—perhaps from pressure on the tract—and injury to the nerve, with monocular hemianopsia.

DISEASES OF THE CONJUNCTIVA.

General Etiologic Factors.—[Numerous articles during the past year have been devoted to the causes of conjunctivitis other than those that have been hitherto repeatedly observed. The microscope plays no unimportant part in the diagnosis, since it is conceded that various forms of bacilli, both those found in general disease, such as diphtheria, and others more special in character, find their best development in the mucous membranes and their excretions].

Moore⁵ emphasizes the importance of nasal disease as a cause of an intractable chronic conjunctivitis, and exposure to the sun's rays, or the impact of wind in sailing or driving, and electric light.

The causative connection between nasal and ocular disease is strengthened by the observations of Ferson and Gabrielides,⁶ who demonstrated that the

¹ Centralbl. f. prak. Augenh., May, 1895.

² Ann. d'Oculist., Aug., 1894.

³ Am. Jour. Med. Sci., June, 1895.

⁴ Klin. u. Anatom. Beit. z. Path. d. Gehirns., Theil 3, 1894.

⁵ Post-Graduate, Sept., 1894.—Therapeutic Gazette, Dec. 15, 1894.

⁶ Arch. d'Oph., Aug., 1894.

bacillus of ozena, resembling the pneumonia bacillus of Friedländer described by Loewenberg, has been found in the conjunctiva of patients suffering with ozena, and that its presence is a menace to the eye in case of entrance or lodgment in the cornea. The presence of these bacilli in the normal conjunctival sac is shown by Bach,¹ who discovered 27 different forms. Each was planted on the abraded surface of a disinfected rabbit's cornea with the result of inducing ulceration. On the other hand, Lachowicz² examined the conjunctival secretions from 63 healthy eyes in 32 healthy persons and found bacteria in 19 eyes of 15 persons. Cocci were met with more frequently than rod-shaped microbes. He introduced microbes in pure cultures into his own conjunctival sacs, which were known to be free from bacteria, and proved that the inoculation did not give rise to any subjective or objective phenomena whatever, and that the bacteria disappeared completely from the eye within twenty-four hours after the inoculation.

Bach³ examined 100 conjunctival sacs, most of them normal, and found 27 different microbes, of which 2 have not been described before. He investigated the action of the tears on the bacteria and concluded that the tears have a feeble bactericidal power. The aqueous humor is not protective, while the vitreous is a good culture-medium. He is of the opinion that the best antiseptic measures before operations are to clean the conjunctival sac mechanically with cotton, wet with physiologic salt solution, and at the same time to irrigate with mercuric chlorid 1 : 2000. He recommends the following ointments in the order of their germicidal action : Mercuric chlorid, 1 : 2000 ; silver nitrate, 2 per cent.; copper sulphate, 1 per cent.; the yellow oxid of mercury ointment he places last.

Diphtheric Conjunctivitis.—A case of croupous as distinguished from diphtheric conjunctivitis, in which an examination of the false membrane revealed the absence of bacilli, is described by Albert.⁴

In a case of intense swelling and chemosis Fraenkel⁵ detached the false membrane and examined the exposed conjunctival surface. He found fibrous structure, pus cells, and bacilli resembling the bacillus of Loeffler. Cultures showed characteristic diphtheria bacilli. The urine was slightly albuminous—a condition not unfrequently found in diphtheric conjunctivitis and worthy of consideration in the differential diagnosis in cases of uncertain origin. The internal administration of arsenic, Bronner,⁶ and the deposit of crystals of uric acid, Kuhn,⁷ are noted as causes.

The presence of the Klebs-Loeffler bacillus is essential to the diagnosis of diphtheric conjunctivitis. Uhthoff⁸ says the conjunctiva may be the

¹ Graefe's Arch. f. Ophthal., Bd. xl., Abt. 3, Dec. 27, 1894.

² Brit. Med. Jour., Oct. 20, 1894.

⁴ Gaz. hebdom. d. Sci. Méd., July, 1894.

⁶ Brit. Med. Jour., Dec. 22, 1894.

³ Graefe's Arch., vol. xl., p. 3.

⁵ Ann. d'Oculist., Oct., 1894.

⁷ Méd. Moderne, May 19, 1894.

⁸ Wien. Klin. Woch., Nov. 15, 1894.

starting point of the general disease, and the only abiding place of the bacillus in cases in which the constitutional symptoms are marked. The value of antitoxin as a means of cure in two cases of diphtheria of the nose and throat is shown by Jessop.¹ The membranes disappeared in three and four days, leaving healthy surfaces.

Purulent Ophthalmia.—The attention of the profession is repeatedly called to the importance of the prevention and cure of purulent ophthalmia, and the subject is considered by ophthalmic surgeons and others as worthy of legal control. Laws have been passed by many States imposing duties and penalties on midwives and health-officers for the proper protection of the eyes of infants that have become infected either before, during, or after birth. Friedenwald² thinks the source of infection is the physician's or nurse's hands after the membranes are ruptured and before the birth of the head.

In a very able paper³ Trousseau treats fully of the symptoms, complications, and treatment. He calls attention to a point that has received scant mention by others: "That while in the beginning the pus is abundant and swelling intense, in a day or so both diminish, and that this is the dangerous time, and the observer must not be lulled into false security; surveillance must be incessant." Kohn⁴ expresses the general sentiment of ophthalmic surgeons and obstetricians when as to ophthalmia of the newborn he recommends Crédé's method of prevention—dropping between the lids a few drops of a 2 per. cent. solution of silver nitrate immediately after delivery of the head; he deprecates simple washing or irrigation. He has never seen keratitis follow this treatment. Most of the cases of infection have arisen when the treatment has been omitted. Statistics are given by Silex⁵ which show that out of 100,000 eye-patients there were 1.11 per cent. of cases of ophthalmia neonatorum. Thus in recent years the percentage has decidedly fallen off. In the concluding chapter of the article alluded to, Kohn remarks, "blennorrhea neonatorum can and must be eradicated from every civilized country." The well-established treatment by nitrate of silver is still, as it should be, in vogue. New remedies have been suggested as supplementary. Abadie proposes⁶ cleansing with mercuric chlorid 1:5000, potassium permanganate 1:1000, silver nitrate 1:1000. Tweedy⁷ advocates the usual cleansing measures and nitrate-of-silver treatment. In corneal involvement he substitutes for the other lotions that may have been employed a solution of quinin sulphate, gr. iv. to \mathfrak{ss} , to be used in the intervals between the applications of the silver. Kalt⁸ recommends irrigation of the cul-de-sac by a tube especially adapted to the purpose.

¹ Med. Press, Feb. 13, 1895.

² Med. News, March 9, 1895.

³ Jour de Méd. de Paris, Aug. 12, 1894.

⁴ Centralbl. f. prak., Angenh., April, 1895.

⁵ Zeits. f. Geburtshilfe u. Gynäk., Bd. xxxi., Heft 1.—Centralbl. f. prak. Angenh., May, 1895.

⁶ Arch. d'Oph., July, 1894.

⁷ The Practitioner, March, 1895.

⁸ Bull. de l'Acad. de Méd., Oct. 16, 1893.

Mittendorf¹ applies boric acid ointment 1 part, vaselin 10 parts, to the conjunctival sac every few minutes to prevent adherence of the lids and retention of the secretions.

Amyloid Degeneration.—It has been established by the researches of Kruch and Funagelli² that amyloid degeneration of the conjunctiva is a purely local disease, and independent of any preceding inflammatory process. They found two forms of microbes, of which one proved to be the staphylococcus pyogenes albus and the other they believe to be the bacillus of Löffler. "The excision of even a portion of the degenerated tissue alleviates the condition and leads to a cure."

Pemphigus.—Similar findings were the result of investigations in cases of pemphigus by Albrand.³ The writer adds a new case to the list of 30 hitherto reported. The trouble had commenced about eight years before the patient came under notice. The lids of both eyes were swollen, the edges thickened and excoriated, and there were distichiasis and trichiasis, entropion, photophobia, lacrymation, shrunken palpebral and ocular conjunctiva, symblepharon, xerosis, and vascular and opaque corneæ. Microscopic examination of the secretion showed amorphous masses of detritus, lymph-cells, xerosis-bacilli, and a few cocci. Sachsaler⁴ describes the thirty-fourth published case. The disease made uninterrupted progress notwithstanding a plastic operation. Bacteriologic examination of the contents of one of the numerous bladders or cysts scattered in the skin proved the presence of the streptococcus.

Three cases, in addition to 35 previously reported, are described by Glass.⁵ The symptoms were general and local. The third case followed scarlet fever. The bladders and cysts, appearing on the mucous membrane of the mouth, throat, and nose, conjunctiva and cornea, were followed by extensive cicatrization and limitation of movements of the balls and of the size of the commissure, and opacity in the cornea with almost complete destruction of the vision.

The treatment by mercuric chlorid 1 : 10,000, cocain, atropin, boric acid, and operations was successful in saving some vision.

Borthen's patient⁶ was a woman aged seventy-four, who had cysts in the larynx that ruptured and discharged blood and serum; there was extensive symblepharon in both eyes, and the corneæ were opaque; there were no cysts on the skin; two small excoriations on the conjunctiva extended from fornix to limbus and over the cornea. The surface of the conjunctiva bled when lightly touched. This is the thirty-ninth case reported and the first from Scandinavia.

Trachoma.—[The etiology of granular conjunctivitis and its relation to

¹ Am. Gyn. and Obst. Jour., Apr., 1895.

³ Klin. Monatsbl. f. Augenh., July, 1894.

⁵ Klin. Monatsbl. f. Augenh., Jan., 1895.

² Ann. d'Oculist., July, 1894.

⁴ Klin. Monatsbl. f. Augenh., Jan., 1895.

⁶ Klin. Monatsbl. f. Augenh., May, 1895.

papillary and follicular conjunctivitis is still an undecided question.] Moor believes the diseases are the same, but modified by individual and social conditions.¹ From experience in 2545 cases of trachoma, clinically and microscopically examined, he holds that both diseases, chronic conjunctival blennorrhea and trachoma, are quite analogous, and agrees with the opinion that trachoma is a disease of infection—the contagion originally coming from gonorrhea. He is convinced that there is only one trachoma, sometimes appearing as the so-called papillary form and sometimes as the follicular or granular variety. Anatomically, it may develop as limited trachoma-granules, and with marked papillary growth, or there may be a significant growth of granules with moderate papillary hypertrophy and more or less thick cellular infiltration of the whole conjunctival connective tissue. In strengthening this position he reminds us of the identical cause, same duration, similar complications and sequels. Gonorrheal secretion will induce both the clinical and anatomic picture of pure trachoma or pure chronic blennorrhea, and the secretion from a trachomatous eye will produce in one instance trachoma and in another blennorrhea, or in the same individual each type of inflammation will be manifested in the two eyes. He details a case of blennorrhea produced by gonorrheal secretion. An instance of the contagiousness of the secretion of mucopurulent conjunctivitis is given by Snell.² An epidemic of subacute follicular catarrh, arising from no assignable cause, attacked a large proportion of the boys and teachers in a good-class boarding-school, and, notwithstanding that the school was broken up, the buildings thoroughly cleansed and rendered aseptic, the disease broke out afresh after the return of the scholars. The manner of conveyance of the contagion in eastern countries has been studied by Viger,³ who considers the school the most prolific source of contagion to the household; the mother is frequently affected (50 per cent. of cases), the father seldom. The Spaniards, Jews, and Arabs are particularly prone to attack.

As to the medicinal treatment, various remedies are urged as efficacious in substituting or complementing the usual methods. Wicherkiewicz⁴ in acute trachoma cleanses the everted lid with a 3 per cent. boric acid solution, then applies to every part of the conjunctiva mercuric chlorid 1 : 500 or 1 : 1000, and finally a compress that has been soaked in a 10 per cent. solution of tannin in glycerol, held firmly by a bandage. Scott⁵ substitutes the cyanid for mercuric chlorid solutions of mercury 1 : 1000. He has found pyoktanin to be utterly useless.

Opinions as to the value of the surgical treatment of trachoma are as various as the methods advocated. Pargens,⁶ in order to estimate the value of the

¹ Klin. Monatsbl. f. Augenh., April, 1895.

² Brit. Med. Jour., Nov. 17, 1894.

³ Ann. d'Oculist., July, 1894.

⁴ Internat. Rundschau, Sept., 1894.

⁵ Brit. Med. Jour., Sept. 15, 1894.

⁶ Zehender's Monatsblatt. f. Augenh., May, 1894.

various mechanic treatments of trachoma, excised before, during, and after treatment, pieces of conjunctiva and tarsus for microscopic investigation. All methods were found defective and affected a comparatively small number of the trachoma-follicles. [This is in keeping with the opinions of conservative observers and is in striking contrast with the wonderful results claimed by the enthusiastic advocates of some particular mode of operating.] Schmidt-Rimpler is opposed to Hoor's belief that follicular and granular conjunctivitis are one and the same disease.¹ Clinically and pathologically the diseases are different. The diplococcus of trachoma is not found in follicular conjunctivitis, and the lymph-glands are more frequently involved in other forms of eye-disease than in trachoma. The infiltration in the follicular variety is confined to the tumors, while in trachoma it is distributed to the intermediate portions of conjunctiva, and thus the depressions and elevations are less marked. Trachoma always leaves a cicatricial membrane, while the follicular form entirely recovers; trachoma is directly contagious, and nearly always both eyes are affected. It is encouraged by great heat, damp climate, crowded dwellings, disposition, and other eye-diseases. Pannus is the rule. The treatment is mercuric chlorid 1 : 2000, and expression by the improved roller-forceps of Knapp or Schmidt-Rimpler. Afterward, as a simple conjunctivitis, the course of the disease is materially shortened. Malgat² in an important paper presents the treatment of granular lids by electrolysis in the most favorable light.

A combination of operative and medicinal measures is urged by Venne-man,³ who believes that the relief following surgical measures comes simply and solely from the loss of blood. In severe cases he performs Galezowski's operation of excision of the superior fornix, and believes that the inflammation in the tarsal conjunctiva is not more intense than that in the ocular. Medical treatment alone is inefficacious. He combines scarification with irrigation by mercuric chlorid 1 : 500. If the method of life, hygiene, etc., are changed a relapse does not occur.

Xerophthalmos.—In xerophthalmos or dryness of the conjunctiva, Rudine⁴ reports an excellent result that followed suturing together of the lids in order to prevent evaporation.

Chancre of the Conjunctiva.—Darier⁵ reports a case of hard chancre of the inferior culdesac caused by the saliva of a syphilitic with a sore mouth.

Parasites in the conjunctiva are of extremely rare occurrence in Europe and America. Robertson⁶ reports the following interesting case: A worm 25 mm. long, which proved to be *Filaria Loa*, made its appearance beneath the conjunctiva of a woman, aged thirty-two, while a resident of Old Calabar,

¹ Berlin Klin. Med., Jan. 7, 1895.

³ Arch. d'Oph., July, 1894.

⁵ Soc. d'Oph. de Paris, June, 1894.

⁶ Oph. Soc. of the United King., Oct. 18, 1894, Oph. Rev., March, 1895.

² Rec. d'Oph., Sept., 1894.

⁴ Ann. d'Oculist, May, 1894.

on the West Coast of Africa, and had reappeared from time to time for seven months; it was successfully removed. It seemed probable that the parasite gained access to the body through the water. Dr. Patrick Manson stated that the blood of 50 per cent. of the negroes of that part of West Africa contained embryos of filaria. He thought it probable that they were introduced by mosquitoes. In a later report Robertson¹ states that after the removal of the parasite the patient experienced no trouble for six weeks, when a swelling appeared in the right temporal region, and a worm was felt under the right upper lid. An incision was made, and after dissection a filamentous body was found, smaller than the ordinary filaria. Deeper in the tissues was a well-developed filaria. Careful examination of the patient's blood from time to time failed to reveal a trace of filaria or its embryo. Swelling of the arm, noticed in this case, is said to occur frequently among the inhabitants of the island of Calabar.

DISEASES OF THE CORNEA.

Arcus Senilis.—Gruber² has suggested the novel explanation of this condition, that it is not a fatty degeneration of the cornea proper, as described in the text-books, but a deposit or collection of round concrete cells having no direct connection with the corneal stroma but attributable to the circulation and blood-pressure. That part nearest the periphery, excepting immediately adjacent to the sclera, the nutriment of which is supplied from the scleral circulation and which remains clear, is nourished by lymph driven by blood pressure, while the center of the cornea is sufficiently supplied by its own lymph-circulation and is consequently not affected by the diminished pressure in age. [Instances have been reported of arcus senilis in very young children in whom disturbance of circulation could not be assigned as a cause. They are, however, rare and anomalous.]

The Corneal Reflection Test.—Maddox³ is in the habit of using the reflection of the ophthalmoscope mirror in the clear cornea to aid, by its

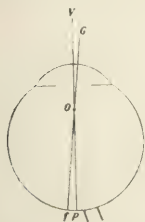


Fig. 1.—G, O, f, geometric axis; V, O, P, visual axis (Am. Jour. Med. Sci., July, 1894).



Fig. 2.—To show symmetric positions of the images (Am. Jour. Med. Sci., July, 1894).

position in relation to the pupil, in the diagnosis of the direction of the axis of vision, the truth of the patient's statement as to monocular blindness, the

¹ Ann. d'Oculist., April, 1895.

² Wien med. Woch., Nov. 17, 1894.

³ Am. Jour. Med. Sci., July, 1894.

presence of high myopia or hypermetropia, or of a macular scotoma or muscular paralysis. [Most ophthalmic surgeons were familiar with corneal reflection-tests before the appearance of Maddox's paper, but not, perhaps, in the particular applications suggested. His paper will serve to call attention to the advantages of this simple and reliable method.]

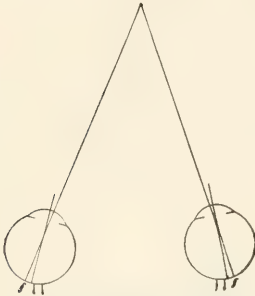


Fig. 3.—To illustrate how each visual axis traverses the cornea to the inner side of its center; drawn to scale one-half life size: *f*, posterior termination of the visual axis (Am. Jour. Med. Sci., July, 1894).

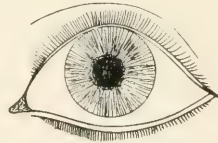


Fig. 4.—To show the corneal image in an average eye; the pupil displaced slightly inward, and the corneal image displaced still more inward (Am. Jour. Med. Sci., July, 1894).



Fig. 5.—To show the asymmetry of the images when the eyes look away from the mirror, though the eyes are not squinting—illustrating how *not* to use corneal images (Am. Jour. Med. Sci., July, 1894).

Ulcer of the Cornea.—The microscopic studies of Uthoff¹ demonstrate beyond all question the presence and activity of one or more germs in infectious ulcer of the cornea. He found in 14 of 25 cases examined the Fraenkel-Weichselbaum diplococcus. Bach's studies² confirm Uthoff's findings. In order to determine the effect of the subconjunctival injection of mercuric chlorid (1 : 2000, 1 : 1000, and 1 : 800) he inoculated the central part of rabbits' corneae with staphylococcus pyogenes aureus in 40 experiments, and concludes positively that the subconjunctival injection has no therapeutic value. To determine whether such solutions are not positively harmful in purulent processes in the interior of an eye, he examined bacteriologically 60 eyes, and concluded that, with the exception of those eyes in which the interior of the ball was in communication with the outside through a perforation, or abscess not secondary to a perforation, bacteria were not present in the anterior chamber, iris, or ciliary body, or anywhere else in the eye. Therefore such injections are of no value and are noxious. He says the pus in hypopyon comes from separation from the cornea and deposit in the anterior chamber of fibrous substances and of leukocytes out of the vessels of the ciliary body. As causal factors for the inflammation and for the irritation of the bloodvessels are the protein and effete material developed by the bacteria and diffused through the cornea. He says positively that also

¹ Wien. Klin. Woch., Nov. 15, 1894.

² Graefe's Arch. f. Oph., Bd. xli., Abt. 1.

in infected penetrating wounds, in septic emboli, or when surely or probably the killed bacteria repose in the eye or in syphilitic inflammation, subconjunctival injections are valueless. This statement he proves by chemie examination. He recommends in the treatment of purulent corneal ulcers the repeated washing out of the conjunctival sac with mercuric chlorid, 1 : 3000, scraping the floor of the ulcer, removing all debris, and cauterizing the floor and edges. There is no doubt that bacteria spread and multiply in the lymph-canals of the cornea; therefore he believes that the inflammation of the iris and ciliary body and the intense conjunctival inflammation complicating corneal ulcer depend upon an extension of bacteria induced by the presence of protein and effete material. In corneal infections and hypopyon Mules¹ uses an iodoform-wafer, softened by soaking a minute or two in cold boric acid solution. It is laid over the cornea, the lid is drawn from the globe, the eye gently closed and held by a pressure-bandage. Roger² has successfully treated 50 cases by a pad of hydrophyllium glued around the orbit by collodion and held by a tarlatan bandage. The eye and the ulcer were washed out with mercuric chlorid 1 : 10,000, and the anterior chamber, in cases of extensive perforation, with a 5 per cent. solution of resorcin in sterilized water. DeWecker, whose experience is very large, disapproves of the routine employment of collyria in the treatment of corneal ulcers, on account of the danger of infection. He recommends vigorous disinfection of lids, conjunctiva, and lashes, grattage of the ulcer, followed by irrigation, subconjunctival injections of mercuric chlorid, and pressure-bandage. The source of corneal ulcers is in some cases extension to the conjunctival sac of chronic inflammation of the nasal mucous membrane,³ and of infectious material conveyed by hand from a dirty mouth to the eye.⁴ Such causes must be removed, and the ulcer treated by antiseptics of the lacrymal passages and conjunctiva, galvanocautery, and tonics.⁵

A cause of purulent disease and necrosis of the cornea that must not be overlooked is paralysis from central lesion of the fifth nerve.⁶ A new remedy that has been suggested by Dolgenhow⁷ for the treatment of ulcers of the cornea is lactic acid dusted on the surface of the cornea. "In six cases of annular ulcer of the cornea the progressive course of the keratitis was checked by a single application." [In obstinate keratitis and in other diseases of the eye, such as iritis, mydriasis, neuritis, and amblyopia, the condition of the teeth should be investigated.]

Since the cornea derives its nourishment from the conjunctiva and anterior ciliary vessels, every ulcer or erosion, excepting when there is free conjunc-

¹ Trans. 8th Internat. Oph. Cong.

² Ann. d'Oculist, Oct., 1894.

³ Zeigler, Trans. Penna. State Soc., May, 1894.

⁴ Thompson, N. Y. Med. Jour., Oct. 13, 1894.

⁵ Dunn, Virgin. Med. Mon., 1894, and Darier, Soc. d'Oph., June, 1894.

⁶ Callan, Trans. Am. Oph. Soc., 1894. Kutsche, Centralbl. f. prakt. Augenh., Oct., 1894.

⁷ N. Am. Pract., Nov., 1894.

tival discharge, demands support by a well-fitted bandage. Continuous heat, like continuous cold, paralyzes the bloodvessels. Therefore, poultices or hot-water bathing should be frequently, but not constantly, used. Atropin is generally useful, eserin when perforation threatens near the periphery; cocain is deleterious, since it lowers the vitality of the cornea by destroying protoplasm. Daily applications of tincture of iodin to the ulcer will check its advance in cases in which the galvanocautery has failed.¹ A unique cause of ulcerative keratitis is the sting of a wasp.²

Interstitial Keratitis.—Inherited syphilis is one of the most frequent causes of interstitial keratitis. Whether or not it is a result of acquired syphilis, arising independently of the chronic low grade iritis common to the third stage, is uncertain. Reynolds³ believes that latent syphilis may become manifest after long periods of time, and that in such cases the cornea is often the seat of the disease. Evans⁴ believes that a large proportion of cases are due to inherited syphilis, and that the disease may be communicated by either father or mother, and later than two or three years after the inoculation; that Colles's law (that a woman who has borne to a syphilitic husband a syphilitic child, although she has never herself shown any symptoms, is protected against contagion) is not borne out by facts. A favorite prescription of Reynolds for a child under five years of age is: Quinin sulphate, gr. $\frac{1}{12}$ — $\frac{1}{16}$; mercuric chlorid, gr. $\frac{1}{50}$, every three or four hours. [We have often used with entire satisfaction a somewhat similar combination: mercurous chlorid, gr. $\frac{1}{12}$; quinin sulphate, gr. $\frac{1}{3}$, three times daily.]

All indigestible ferments should be excluded from the diet. In rheumatic sclerokeratitis the most useful remedy is sodium salicylate,⁵ 60 grains daily.

Purulent Keratitis.—A new, and hitherto undescribed, acute purulent keratitis with some unusual features is reported by DuGourlay,⁶ which appears to be a special type of keratitis of very sudden onset, and having as its exciting cause an injury. The bulbar conjunctiva becomes suddenly red, and the corneal margin is covered with a fine vascular network more dense at the point where the inflammatory process in the cornea is imminent; there is intense photophobia and lachrymation, and about the third or fourth day there appears a dense corneal nucleus at first no larger than the head of a pin, of a yellowish-gray halo, situated in the center of the substance of the cornea, leaving the epithelium and Bowman's membrane perfectly transparent. As it progresses the destruction of the corneal elements is invariably toward the anterior chamber, and soon Descemet's membrane is forced inward like the "core of a furuncle," and forms a hernia in the anterior chamber, into

¹ Koller, N. Y. Med. Jour., Mar. 30, 1895.

² Purscher, Centralbl. f. prak. Augenh., April, 1895.

³ Jour. Am. Med. Assoc., Oct. 13, 1894.

⁴ Am. Med.-Surg. Bull., Jan. 15, 1895.

⁵ Pfälz. Centralbl. f. Augenh., Jan., 1895.

⁶ Ann. d'Oculist., Jan., 1895.

the lower portion of which the diseased mass falls after a longer or shorter period. Later the anterior layers of the cornea become infiltrated, lose their transparency, break down, and, if the process is not arrested, the lens escapes. As this disease occurs most commonly in broken-down subjects, many of whom have ectropion of the lower lids or lacrymal disease, the prognosis is unfavorable, but by the use of vigorous measures some remarkable results have been obtained. The surgical methods employed, according to the stage of the disease, are grattage, cauterization, and keratotomy, removing the detached mass, with or without cauterization. In speaking of its pathology the author says: "In the absence of any precise means of histologic analysis I cannot certify to the exact composition of this focus of disease which I have so often extracted either from the cornea or from the anterior chamber." On the border of the ulcer are found proliferating nuclei in abundance and numerous leukocytes.

Several attempts have been made in the laboratory to discover the special microorganism that may be the cause of this disease, but only already-known bacteria have been found: the staphylococcus accompanied by the streptococcus, the latter particularly abundant.

Descemetitis.—A very important announcement is made by Snellen¹ in reference to the results of microscopic examinations in two cases of descemetitis, in which a paracentesis was performed to relieve tension. Snellen was enabled to obtain specimens of the small, characteristic, rust-colored masses deposited on the posterior surface of the cornea. In one instance the mass was found to consist, not of a cluster of cells, but of a collection of microbes that he succeeded in cultivating on agar-agar. They proved to be short bacilli. In the second instance he found cells as described in the text-books, but between them were microbes similar to those in the first case. Snellen considers descemetitis to be a distinct disease, for which he prefers the old name instead of the term serous iritis or cyclitis, and he believes it to be due to microbes growing in the anterior chamber, which by producing toxins cause an irritation of the uveal tract.

Corneal Opacities.—In the removal of corneal opacities Green² and Dennis³ consider electrolysis the most effective means. The latter treated several cases by different methods. The best results in the majority of cases are obtained from the judicious varying of methods, direct massage of the

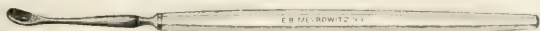


Fig. 6.—Instrument used in the treatment of corneal opacities (Morton, Medical News, Sept. 1, 1894.).

cornea (Morton)⁴ pressure-inunction, yellow oxid of mercury, or both combined, and then electricity applied according to the method devised by Dr. Alleman of Brooklyn, N. Y.

¹ *Bost. Med. and Surg. Jour.*, Dec. 27, 1894.

² *Ann. Oph. and Otol.*, July, 1894.

³ *Ann. Oph. and Otol.*, Jan., 1895.

⁴ *Med. News.*, Sept. 1, 1894.

Phlyctenular Keratitis.—Galezowski¹ recommends phenate of mercury in diseases of the cornea, especially in herpetic phlyctenular keratitis. He considers it an advantageous substitute for yellow oxid ointment, which is at times irritating, but it should not be used until mydriatics and heat have reduced the congestion.

Traumatic Ulcer.—The operative treatment of the traumatic ulcer made by the removal of the head of a pterygium, suggested by Schirmer,² is novel. Cicatricial pterygium is a fold of conjunctiva drawn over and into the cornea by contraction of a scar, differing thus from a real pterygium. Several operations, conjunctival, plastic, transplantation of conjunctiva of a rabbit or man, or human skin have been proposed. Schirmer relates a successful case of transplantation of pieces of a rabbit's cornea (removed by a sharp knife thrust between the corneal layers instead of using Von Hippel's trephine), and transplanting them into the cleansed wound in the cornea caused by the removal of the cicatricial pterygium. The symblepharon was separated and with the corneal part so arranged in the sac that it filled up the place of the old symblepharon. The vision in four months was $\frac{1}{2}$, increased from $\frac{1}{7}$, and appearances were greatly improved. [This seems to be a rational proceeding, but useful in a very limited number of cases. If the cicatricial tissue can be forcibly jerked from the cornea the ulcer rapidly fills up with new tissue nearly or quite as transparent as the old.]

Many corneal diseases are illustrated by Max Knies,³ by black and white drawings, arranged in a series of plates, useful for demonstration in dearth of clinical material.

DISEASES OF THE IRIS AND CILIARY BODY.

[Contributions to the various forms of iritis and cyclitis have been few and in the main unimportant, with the exception of those treating of tuberculous iritis, which have been in part reported in the section on diseases of the cornea].

Congenital Diseases.—In an eye otherwise normal von Rosenzweig⁴ had his attention called to a flattened, round, pearl-gray cyst or bladder, 3 mm. in diameter, which was noticed in a child by the parents, a few days after birth, on the surface of the iris. The cyst increased in size while the patient was under observation to 5 mm. in diameter. Through a corneal incision it was punctured by a thrust of a Graefe knife and the clear watery contents evacuated. The collapsed bladder and underlying iris were excised. The cyst-wall, consisting of two layers of distended stroma of the iris, was vascular and lined with several layers of true epithelial cells. The author believes that the growths commenced in the epithelial cells of the iris before birth.

¹ Ann. d'Oculistique, Jan., 1895.

² Deutsch. med. Woch., Sept. 27, 1894.

³ Augenärztliche Unterrichtstafeln, H. Magnus, 1894.

⁴ Beit. z. Augenh., Heft. 14, 1894.

Tumors.—Howe¹ has noticed in myopes small multiple growths resembling cysts, probably papilloma, slowly increasing in size, on the pupillary border of the iris. Clark² reports 2 cases of serous cyst of the iris. The first was probably congenital. It had its origin in the posterior layers of the iris and ciliary body, and grew backward into the vitreous, dislocating the lens. The second was nontraumatic and presented the appearance of a symmetric, two-pouched sac, distended with fluid. The cyst was incised and allowed to remain; eight years afterward it had not refilled.

The fourth reported case of melanotic sarcoma of the ciliary body³ by Hirschberg and A. Birnbacher is interesting. The tumor involved the ciliary body, extending forward into the anterior chamber, and backward into the center of the vitreous, 15 by 13.5 mm. It was deep brown and light gray in color, and divided by strongly pigmented septa into three small parts and one large portion. Microscopically, it presented the usual features of a mixed-cell, pigmented, choroidal sarcoma.

Traumatic Aniridia.—In a case of total disappearance of the iris, the result of a severe incised wound which did not injure or dislocate the lens, Rene⁴ determined that the accommodation was not affected. Three years after the injury, vision through a stenopaic slit was normal. [That diphtheric paralysis of accommodation does not modify the action of the non-paralyzed iris is well known, yet it is difficult to believe the author's statement that total absence of the iris, the result of a blow, can coexist with full range of accommodation and normal vision.]

Wintersteiner⁵ exhaustively describes the clinical and microscopic findings in 6 cases. In all the iris, in some the lens and other parts of the eye, were destroyed. Vision was entirely lost.

Causes of Iritis.—Inflammation of the iris is caused by purulent diseases of the posterior layers of the cornea more frequently than of the anterior layers, particularly if the latter are intact, by absorption into the neighboring parts through increased hydrostatic pressure, according to Burchardt.⁶ The prognosis is good provided the parts are kept well cleaned and bandaged with antiseptic dressings. The same author reports a case of iritis and cyclitis of the left eye and detachment of the retina of both eyes after gonorrheal rheumatism. He believes that the ocular inflammation was not merely a coincidence, but a result of the urethral inflammation.

Syphilitic Iritis.—The symptoms and course of diseases of the iris caused by constitutional syphilis are well described by Wickham,⁷ and by Fournier.⁸ The former calls attention to the liability of the inflammation to recur and to its tendency to involve the choroid and the danger of sympathetic inflam-

¹ Trans. Am. Oph. Soc., 1894.

² Centralbl. f. prakt. Augenh., Jan., 1895.

³ Graefe's Arch. f. Oph., Abt. 2, 1894.

⁴ Gaz. Méd. de Paris, Feb. 17, 1894.

⁵ Trans. 8th Inter. Oph. Cong., 1894.

⁶ Gaz. des. Hôpitaux, Oct. 9, 1894.

⁷ Charité Ann., Berlin, xix., 1894.

⁸ L'Union Méd., Mar. 1, 1894.

mation. [The second eye seldom escapes, but its inflammations are syphilitic and not sympathetic.] Fournier believes the affection of the iris is a syphilide rather than a plastic inflammation, by reason of the slowness of its evolution, moderate intensity, and frequent absence of pain. In two eyes Berger¹ found hyaline formations on the internal surface of the vitreous lamella of the pars ciliaris retina: One was a case of iridocyclitis, the other of atrophy of the ball. He found the same conditions in an eye affected with tuberculosis of the uveal tract. Leber has shown that in the normal condition penetration of the aqueous into the cornea is prevented by the endothelium of Descemet's membrane, and Berger that the endothelium of the posterior surface of the iris prevents it from entering the pigment-coat, just as the anterior capsule acts for the lens.

Tuberculosis of the Iris and Ciliary Body.—Machek² found 3 cases of tuberculous infection of the iris among 40,000 eye patients. The diagnosis is a difficult one. The disease may readily be mistaken for gummatous iritis or other forms of chronic iritis. [This fact probably accounts for the small percentage of cases.] It affects children from two to eight years of age, is monocular, and is almost invariably followed by fatal tubercular meningitis. The disease begins with the usual symptoms of plastic iritis. Later, whitish-gray points are found on the posterior surface of the cornea and nodules of tubercle always vascular on the surface of the iris. Vellhagen³ reports a case differing somewhat from those hitherto published. A boy of 8 years, of healthy parentage and no tuberculous history, had an inflammation of the right eye. A brownish vascular tumor, spreading backward, developed on the posterior surface of the iris, with intense inflammatory symptoms and total loss of vision. The microscope showed tubercle of the iris and ciliary body and deposits of typical tubercle in the vitreous. The sclera and cornea nearest the tumor were transformed into tuberculous tissue. No bacilli were detected in 40 sections of different parts of the eye. [This case demonstrates the possibility of ocular tuberculosis without microscopic evidence of bacilli and without general infection.]

Infectious Iritis.—Catheterization of the urethra in a patient of Trousseau⁴ was followed by abscess of a testicle. Six months later, after catheterization, he had a chill and fever, and in twelve days a purulent iritis. The inflammation increased and in a short time the ball was filled with pus. Starting from the iris, the infection spread to every structure of the eye. The author does not accept the conclusion of Fromaget and Ziem that the inflammation in these cases is due to a migration of pus through veins or lymphatics, but attributes it to a lodgment of microbes.

Vascularization of the Lens-capsule.—Darier⁵ reports the only

¹ Arch. d'Oph., Nov. 1, 1894.

² Wien. med. Woch., June 16, 1894.

³ Klin. Monatsbl. f. Augenb., xxxii., 1894.

⁴ Ann. d'Oculist., Mar., 1894.

⁵ Ann. d'Oculist., Jan. 1895.

case in ophthalmic literature of vascular formation of the lens capsule during chronic iritis. The iris had been the subject of repeated attacks of inflammation leading to extensive synechiæ. The new veins and arteries were distinctly seen ramifying on the lower outer section of the capsule. They were probably formed in the exudate, which was abundant at this point, since they were not continuous with any of the vessels of the iris.

DISEASES OF THE LENS.

Anatomic Changes Other than Cataract are reported by Lany;¹ by Adolph Sachsaler,² who describes drüsen or glands on the anterior capsule as small, isolated elevations, grayish-white, round, oval, or kidney-shaped, 5 mm. in their longest diameter, evident only through the ophthalmoscope in a strong light and in a degenerated eye; by Sym and Müller,³ in which the diagnosis of lenticonus posterior depended upon the dark center or nuclear area surrounded by a peripheral clear zone, and in the center a crescentic darker area which could be well seen by sending oblique rays through the lens from a tilted mirror. The retinal vessels were unevenly refracted and appeared to double on themselves. The case was one of high myopia, with the usual changes in the choroid. Müller believes that while in a number of the cases recorded the defect has been found to consist in a concavity of the central, posterior surface, he attributes this to an anomaly of the nucleus. Dunn⁴ reports a transitory bubble of the lens that caused astigmatism and loss of accommodation. He also mentions 2 other cases in which multiple bubbles preceded the development of cataract. Congenital cataract owes its origin to arrested development, as in rachitic dyscrasia,⁵ or to intrauterine disease. Thus Vuellus⁶ examined microscopically sections from the eyes of a rabbit with congenital double cataract. He found anterior synechiæ, the iris protruding in two places into the lens, the corneal epithelium disturbed, and the scleral border thickened.

Congenital Cataract.—Hirschberg's⁷ experience, consisting of operations on 168 eyes, without a loss, has taught him:—1. To do nothing if vision is $\frac{1}{3}$ or $\frac{1}{2}$. 2. The formation of a new pupil (iridectomy) he does not approve, since the lens is irregular in refraction in its periphery. 3. Discission in the young and extraction by corneal cut in those who have hard lenses. Vision is considerably better after discission than after iridectomy. Bull⁸ and Spencer Watson⁹ advise extraction rather than discission in young patients.

¹ Med. Press, Nov. 21, 1894, "Cholesterine Crystals."

² "Drüsen der vorderen Linsenkapsel," *Beit. z. Augenh.*, Heft 18, 1895.

³ *Oph. Rev.*, March, 1895.—*Klin. Monatsbl. f. Augenh.*, June, 1894, "Lenticonus Posterior."

⁴ *Virg. Med. Month.*, Aug., 1894.

⁵ "Lamellar Cataract and Rickets," Treacher Collins, *Lancet*, Nov. 17, 1894.

⁶ "Angeborener Cataract beider Augen mit Perforation der Linsenkapsel beim Kaninchen," Graefe's *Arch. f. Oph.*, Bd. xl., Abt. 5.

⁷ *Centralbl. f. prakt. Augenh.*, March, 1895.

⁸ *Annal. Oph. and Otol.*, Jan., 1895.

⁹ *Oph. Rev.*, Mar., 1895.

Astigmatism and Cataract.—Roure,¹ after a careful study of corneal astigmatism in 33 cases of double cataract, gives his conclusions as follows: In 80 per cent. of those cases in which the eyes were unequally astigmatic, the first affected with cataract was the more astigmatic eye. After a review of the results obtained by other observers as well as his own, he finally concludes that we are not justified in regarding astigmatism as a cause of cataract, "but as a condition favoring the morbid process when, for reasons that we do not yet know, the crystalline lens becomes opaque." Schoen² ascribes glaucoma and cataract in the majority of cases to chronic overexcitation of the accommodation. He says the prolongations of the ciliary muscle continue around the vitreous as far as the optic nerve, the tendons of the muscle running in the suprachoroida. [His conclusions are surprisingly novel and unsubstantiated.]

Unripe Cataract.—Difference of opinion in regard to the management of immature cataract still exists. DeSchweinitz³ believes operations for ripening are generally unnecessary, since lenses in patients older than sixty years, although not entirely opaque, may be extracted safely; but he is in accord with Bettman's⁴ opinion that the artificial ripening of cataracts in *properly selected cases* is demanded. Direct trituration—section with a lance knife, without iridectomy, and gentle rubbing of the lens in the enlarged pupillary area—is especially useful in senile cataracts with a soft cortex; maturity of the cataract is usually induced in three weeks. (Trituration renders the cortex opaque, but the question is open, "Does trituration or any other process of artificial ripening make the cortex harder?")

Spontaneous Absorption of Cataractous Lenses.—Two cases have been reported by L. L. Thompson⁵ and by Schneideman.⁶

Cataract-extraction.—[Operators of equal reputation continue to discuss the advantages of simple extraction over extraction with iridectomy. The weight of authority is in favor of the former. Its superiority, it is claimed, consists in less traumatism, no hemorrhage, no loss of vitreous, no deformity, and better vision. Advocates of the combined method allege its greater safety, less danger of prolapse of the iris, fewer occasions for secondary operation, and equally good vision.] Neve⁷ resorted to either operation as the necessities of the case seemed to indicate, and had about 6 per cent. of failures. Derby,⁸ in a practical, judicial paper, advises iridectomy, free laceration of the capsule, thorough toilet, installation of a 1 per cent. solution of eserine, bandaging, and redressing the eye without exposing the cut for eight days.

¹ Arch. d'Ophthal., Jan., 1895.

² Die Functionskrankungen des Auges. Ursache und Verhuetung des grauen und gruenen Staars.

³ Jour. Am. Med. Assoc., Jan. 27, 1894.

⁴ Chicago Med. Recorder, Mar., 1895.

⁵ Trans. Brit. Med. Asso., 1895.

⁶ Phila. Polyclinic, Aug. 25, 1894.

⁷ "200 Cases of Cataract Extraction." Edinb. Med. Jour., Nov., 1894.

⁸ Bost. Med. and Surg. Jour., Jan. 31, 1895.

Baueerlein,¹ in his monograph, describes briefly his experience in extracting 860 cataracts. He practises the combined method but speaks in the highest terms of simple extraction, and "means to adopt it in the future, with the expectation of returning to his old method." According to Higgins,² the adoption of cocain and antiseptics has reduced the percentage of failures from $7\frac{1}{2}$ to 3. He gives a table of 19 patients of eighty years and over, the subjects of operation, in whom but one eye was lost, showing that age is not a barrier to operation. Webster³ prefers the combined operation in cases of predisposition to glaucoma, the patient being uncontrollable, when prolapse of the iris has occurred in simple extraction of the lens of the other eye, and when the pupil does not dilate by cocain. His results in 118 operations are, in percentages, loss of vitreous 3.5, incarceration of iris 4, prolapse 9.5, discission 24, successes in 88, partial in 6, failures in 5.

One of the most valuable contributions to the statistics of cataract-extraction is found in the monograph of Heinrich Zenker.⁴ The author lays before his readers unreservedly and in detail the history of all the extraction-operations performed by his chief, Carl, Duke of Bavaria, from July, 1889, to April, 1893, making a record both in number and results worthy of respect and emulation. A feature that gives to this collection a distinctive value for the purpose of comparison with the statistics of others is, that in 995 of the 1000 operations the combined method was selected. The author gives forcible reasons for this preference. Two disadvantages override all benefits claimed by the advocates of the simple extraction, namely, iris-prolapse and secondary cataract. We note in various places instructive and interesting points. Double extraction at one sitting was made 15 times in uncomplicated and ripe cataracts, the eye being absolutely clean and the patient trained and submissive. When these conditions are combined double extraction is advantageous. The preliminaries to operation comprise a bath of the body, head, and face, hair, beard, and eye-brows cut short, syringing of the lacrymal sac and tear-duct with mercuric chlorid 1 : 5000, the cure of chronic conjunctivitis, instructions to the patient as to how he is to move the eyes and obey all orders, the internal organs properly functioning, and thorough asepsis by various strengths of mercuric chlorid—1 : 1000 for the face, 1 : 5000 for the conjunctiva. The early morning was chosen for operation, and when necessary, electric light was used. Local anesthesia was by 2 per cent. cocain, and in 47 cases general anesthesia; the operator himself must be thoroughly clean, the instruments placed in 2 per cent. phenol solution, then dipped in boiling water; the cut is upward in the limbus, followed by a small iridectomy, and the opening of the capsule always with the capsule

¹ "Meine Erfahrungen ueber Staar und Staar-operationen in fünf und zwanzig Jahren, Wiesbaden," 1894. ² "Note on 920 Extractions of Cataracts," *Lancet*, Aug. 11, 1894.

³ *Manhattan Eye and Ear Hospital Report*, 1894.

⁴ "Tausend Staar Operationen," Wiesbaden. 1895.

forceps; the speculum is often removed before the lens is expressed, the toilet is carefully made, and a double bandage applied for five days. Immediately after operation the patient receives chloral and morphin; the eye is redressed in twenty-four hours, and if there are no untoward symptoms the second redressing is in forty-eight hours; fluid nourishment is ordered for three days, and the bandage is finally removed in ten or eleven days, as before that time, he asserts, the posterior chamber is not formed. His results are, good 95.2 per cent., moderate 3.2 per cent., loss 1.6 per cent. The losses were due to wound-infection in 8 after extraction and 1 after discission; of the former, 1 to inflammation of the lids, 1 to inflammation of the lacrymal apparatus, late infection in 3, iridocyclitis 6. There were 168 secondary operations. The operator invariably used Knapp's capsule-knife. He extracted the capsule 10 times. He advocates late discission six weeks after the primary operation, and always performs it by electric light.

Ring¹ has endeavored as far as possible to eliminate the personal equation and to make a fair comparison of the two methods in 2155 cases, 1032 of which were with iridectomy and 1123 without. He finds that "prolapses of the vitreous by the combined method were 7.23 per cent., against 4.27 per cent. by the simple method. The incarcerations of the iris in the combined operation were 4.82 per cent., against 8.66 per cent. prolapse of iris in simple extractions. In the combined operations iritis occurred in 13.15 per cent., in the simple 11.82 per cent. Suppuration was present in the combined operations in 1.91 per cent., and in 1.3 per cent. of the simple extractions. Discission was performed in 33.14 per cent. of the simple and 27.61 per cent., of the combined operations. Perfect successes were obtained in 88.08 per cent. by the combined method, and in 90.82 per cent. of the simple extractions. The failures were 4.47 per cent. in the former and 2.88 per cent. in the latter, while the vision was $\frac{34}{100}$ in the former and $\frac{31}{100}$ in the latter."

By the simultaneous use of injection and aspiration Dr. Chibert² practises thorough irrigation of the aqueous chamber. By means of an ingenious device, made by Aubrey, he has employed this method systematically in 30 cases of cataract-extraction and is well satisfied with the result, having been able to remove cortical fragments in large amounts from the posterior chamber in cases in which the usual methods had been employed and the pupil had appeared to be clear. Kalt,³ in order to prevent prolapse of the iris, proposes that sutures shall be inserted before the cut is made—first by passing a very small needle through the cornea 2 mm. from the scleral border and returned through the cornea; then a similar double insertion in the sclera. The thread is allowed to lie very loosely to avoid danger of division. In 50 cases 47 were perfectly successful and 3 hernias. Trousseau⁴ recom-

¹ Am. Med.-Surg. Bull., Dec. 15, 1894.

³ Arch. d'Oph., Oct., 1894.

² Ann. d'Oculist, Feb., 1895.

⁴ Ann. de Oph., Mar., 1895.

mends corneal suture after cataract-extraction. Of the various accidents following the extraction of cataract, hemorrhage, primary or secondary, of which the source is probably degeneration of the choroidal vessels, is one of the most disastrous. The sight is invariably lost.¹ An unusually large loss of vitreous during extraction with recovery of useful vision has been reported by Lippincott.² The vitreous was fluid and had escaped during a preliminary iridectomy. Six weeks later, immediately after the lens was extracted, collapse of the ball ensued.

Immediate capsulotomy has been advocated by Keiper³ and Fox.⁴

A cause of failure after cataract-extraction is panophthalmitis, fortunately far less frequently encountered than before the advent of antiseptics. Theobald⁵ reports a case following dissection of a capsular opacity, in which the only assignable cause was the syphilitic diathesis of the patient. In purulent infection of the wound and of the interior of the eye, Wienerkiewicz⁶ advises, in the former case, cauterization of the edges, and, in the latter, the opening of the wound and washing out of the anterior chamber with a physiologic salt-solution, and in all cases subconjunctival injections of mercuric chlorid solutions.

Aspiration in the treatment of traumatic cataract has been practised successfully by Landau.⁷

The extraction of cataract as an office-operation has been persistently advocated by Mitchell,⁸ Murrell, Cheatham, and Le Mond,⁹ and strongly opposed by Dunn.¹⁰ [There are reasons in very exceptional instances, that might induce a conservative operator to extract a lens in his office, but in a vast majority of cases the risk is unjustifiable.] Taylor¹¹ agrees with Knapp that the fears of many ophthalmic surgeons in reference to the operation for secondary cataract are unfounded, and warns against the use of too much cocaine and of dragging upon the ciliary body. After the iridectomy he introduces a tongue-shaped lance with rounded edges which, in withdrawal, excises the pupillary portion of the anterior capsule.

The prevention of astigmatism after cataract-extraction by means of a bandage is proposed by Grady.¹² Ten days after operation 10 selected cases were dressed for twenty days with dry compressed bandages, and the results on the astigmatism as compared with 10 other eyes, not so treated, showed a reduction in the amount.

¹ *Lec. Practitioner*, June, 1895.

² *Ann. Oph. and Otol.*, Oct., 1894.

³ *Trans. Am. Oph. Soc.*, 1894.

⁴ *Centrallbl. f. prak. Augenh.*, Feb., 1895.

⁵ *Oph. Rec.*, Aug., 1894.

⁶ *Lancet*, Aug. 18, 1894.

⁷ *Trans. Am. Oph. Soc.*, 1894.

⁸ *Trans. Penn. State Soc.*, 1894.

⁹ *Wien. klin. Woch.*, Nov. 15, 1894.

¹⁰ *Oph. Rec.*, July, 1894.

¹¹ *Virg. Med. Monthly*, Dec., 1894.

¹² *Oph. Rec.*, July, 1894.

DISEASES OF THE RETINA.

Anatomic and Physiologic.—Greef¹ contends that cells similar to those of the cortical substance of the brain were found by him in the optic tracts, nerve, and periphery of the retina, confirming the conception that the retina and optic tract are anatomic expansions of the cerebrum. That the retina is chemically sensitive to the effects of intense light and heat has been shown by Birnbacher.²

The perception of light and colors on the retina is thus explained by Koster:³—Light of different wave-lengths is perceived by different layers of the retina—the greater the wave-length, the farther the percipient elements are anterior.

Koenig and Zumpf had shown that by holding a card with two perforations in it at the anterior focus of the eye, moving it backward and forward, and thus allowing two beams to enter the pupil and throw two shadows of the bloodvessels on the retina, these will be recognized as projections at different distances for different degrees of light; in this way we are able to satisfy ourselves that the percipient layers of the retina are on different planes. The author was unable to see these projections by the method suggested, and employed a modification of Müller's method. Instead of focusing the light on the sclera with one strong convex lens he used two convex lenses placed obliquely to each other, and by this and other means he determined that the position of Koenig⁴ and Zumpf could not be sustained. He considers that the refraction of the eye is better able to explain the fact, and that different colors of the spectrum, being unequally refracted, are projected to different levels and distances. He uses the spectral colors in turn and computes the relation of the shadows to one another and the rapidity of the parallax movements caused by shifting the direction of the illumination.

Detachment of the Retina.—A new suggestion in the treatment of detachment of the retina, worthy of trial, has been made by Deutschmann,⁵ who accepts Nordenson's theory of chronic thickening of the vitreous without loss of transparency, the cavity or vacuum thus made by the contraction of the vitreous being filled by serous fluid. Under pathologic conditions that part of the retina in close connection with the vitreous is dragged inward. The changes in the vitreous are similar to senile tissue-thickening and proliferation, and are due to chronic inflammation of the choroid. The retina is often ruptured, the fluid escaping through the tear into the subretinal

¹ Ann. d'Oculist, July, 1894.

² "Beitrag z. Chemismus der Netzhaut," Wien. klin. Wochen., Nov. 15, 1894, No. 46.

³ Graefe's Arch. f. Ophthal., Bd. xli., Abt. 1.

⁴ Trans. Soc. d'Oph. de Paris, Arch. d'Oph., July, 1894.

⁵ Beit. z. Augenh., Heft xx., 1895.

space, but the rupture is not essential, for the retina may be slowly dragged forward and its former site gradually occupied by the fluid.

When the usual means fail the operative method advised by Deutschmann is incision through the sclera with a sharp double-edged knife, and through the detached folded retina as far as the opposite fold, dividing the vitreous in one or more movements of the knife. The fluid under the retina is allowed to escape. The operation, which is followed by very slight reaction, may be repeated after some days. Deutschmann thus operated in 11 cases, unselected, but mostly with a myopia of 5 D., or higher, with posterior staphyloma, vitreous opacities, and patches of choroidal atrophy. In general the result was favorable but temporary. In some instances the operation was supplemented by boring into the sclera one or two holes with the electric cautery. When the foregoing method proves unsuccessful, under antiseptic precautions Deutschmann injects into the scleral cavity a portion of the vitreous of a rabbit corresponding to 1.5 divisions of a Pravaz syringe. This was performed in 6 patients and 7 eyes, and he says: "In 4 I have achieved results that I had earlier considered unattainable. I believe it will be admitted that the trial of this method in eyes otherwise doomed to blindness is not only justifiable but is a duty." The purpose of the operation is not only to fill the ball with the required amount of fluid, but the fluid must permanently fill the vitreous cavity, cause the subretinal fluid to be dispersed and the retina to become attached, and to create an inflammation of the choroid which will hold it. [These views are given at some length, as they embrace the most recent and scientific results that we have. Schoeler's method, the injection into the vitreous of the tincture of iodine, strongly advocated for a time, has deservedly fallen into disuse.] The effect on the intraocular structures according to Wolff,¹ briefly stated, are: Separation of the retina, total or partial, shrinking of the vitreous, retinal rupture, fluidity of vitreous, severe iridochoroiditis, iridocyclitis, and retinitis. These are sufficient evidence of the danger of the method, which is also condemned by Bull.² The treatment adopted by him in 38 cases was, rest in bed, atropin, bandage, pilocarpin-injections, or, when these are badly borne (as in cases of cardiac disease), potassium iodid and sodium bicarbonate in small doses were substituted, with puncture through the sclera and division of the membranous bands. "In most cases the operative treatment produces but temporary improvement and in many cases no effect whatever." Four cases were cured, 3 by medicine, 1 by puncture. Scheffels³ also condemns Schoeler's method. Schoeler and Alsbrand⁴ claim that an extensive detachment of the retina in a human myopic eye was cured by galvano-puncture.

¹ Graefe's Arch. f. Oph., Bd. xl., Abt. 2.

² Trans. Am. Oph. Soc., 1894.

³ Centralbl. f. Augenhe., Jan., 1895.

⁴ "Experimentelle Studie über galvanolytisch-kataphorische Einwirkungen auf das Auge."

The repeated application of the galvanocautery to the sclera opposite the center of the detached portion is advocated by de Grandmont¹ and by Presos,² who report cures. Straub³ twice injected under the conjunctiva, at the site of a scleral incision opposite the detachment, a few drops of mercuric chlorid 1 : 5000, and found that in three days "the field of vision was almost completely reestablished and remained so after five months."

Armaignac⁴ reports a case of spontaneous cure in a child of nine years. The detachment was due to traumatism, and after recovery from the contusion, vision was perfect, but there was persistence of paralysis of the pupil, without paralysis of accommodation.

Detachment of the retina has been made the cause of a legal suit, as reported by Ohlmann.⁵ A sixty-year-old man had detachment of the retina, causing complete blindness, brought on, as he claimed, by carrying a heavy bag of corn on his back. He brought suit against his employer and won it. It was decided on expert testimony that the cause was in the unusual and heavy work, the affection being due either to a hemorrhage between the choroid and retina, or to an exudation of the choroid, the general blood-pressure excited by the nature of the work being greater than the intraocular tension.

A paper by Mr. Simeon Snell⁶ and one by Lindsey Johnson⁷ deal with injurious effects upon eyesight of intense light and heat. Two thousand degrees F. could be borne with impunity. Higher than this necessitated the wearing of dark glasses by men working in iron foundries, in electric soldering, in stone cutting, ivory grinding, molten metals, among hot cinders, etc. Workers in iodoform and tobacco are not affected. Those in lead are exposed to optic neuritis. Examination of the eyes of workmen in Venetian glass-works showed that all had defective vision and contracted fields from optic-nerve atrophy, although vision was normal on commencing work. One year's time was sufficient to induce impaired vision. "The red and ultra-red rays tend to exhaust the retina."

DISEASES OF THE OPTIC NERVE.

Optic Neuritis.—Bramwell, in his monograph on brain-tumors, states that in 80 per cent. of cases of cerebral tumor optic neuritis or choked disc is a symptom. In an investigation of 140 cases of brain-tumor (in 20 additional cases no mention is made of the condition of the eye-ground or sight, and hence they are not included) Wilder⁸ finds that there were 104 cases of optic neuritis—74.35 per cent., a result closely approximating that of Bramwell. The most frequent tumors were sarcoma and glioma—90 cases. The

¹ Trans. Soc. Oph., Paris, 1894.

² Revista Med. de Barcelona, Feb. 25, 1894.

³ Ann. d'Oculist, Mar., 1895.

⁴ Soc. Franc. Oph., Paris, Arch. d'Oph., July, 1894.

⁵ Klin. Monatsbl. f. Augenh., Mar., 1895.

⁶ 62d Ann. Meet. Brit. Med. Asso., 1894.

⁷ Ibid.

⁸ Chicago Med. Recorder, May, 1894.

most frequent sites were the motor convolutions and cerebellum. There were only 4 cases of monocular neuritis. In 10 the neuritis was more pronounced in one eye than in the other, and this was in the eye in which the tumor was found, or in which it had reached the larger growth. The apparently more frequent appearance of optic neuritis in cases of glioma and sarcoma is to be explained by the fact that these tumors infiltrate and irritate the brain-substance to a greater extent than the more circumscribed forms that exert their malign influence only by pressure. Regardless of the nature of the growth, tumors in the cerebellum most frequently cause optic neuritis. Optic neuritis may develop before any other symptom, or it may occur at any time in the course of the affection. A suggestive early symptom is the appearance of paroxysms of blindness, lasting a few minutes or half an hour, and recurring with greater frequency as the disease advances. With the subsidence of swelling of the optic disc, visual power may be in part restored, hence in those cases proper for operation, the tumor may be removed, and not only the life, but the sight of the patient saved. [The conclusions derived from a study of these cases are against the theory that intracranial growths bring about optic neuritis by an increased pressure within the skull. The importance of early and repeated examinations of the eye-grounds, of the visual power, and the fields for white and colors should be emphasized.]

The changes in the papilla, according to Elschmig,¹ who made post-mortem examinations in 55 cases of intracranial disease (21 tumors, 28 inflammatory affections, exclusive of syphilitic lesions, 6 cases of hydrocephalus), are as follows:—The venous engorgement is not the cause but the result. The swelling of the papilla is due to edema and other products of inflammation. In all cases there were microscopic evidences of similar changes in the trunk of the nerve. He concludes that choked disc is never due to mechanic interference with the circulation, but to an extension downward of an interstitial inflammation, the origin of which must be sought in meningitis. A second attack of optic neuritis in the same individual is extremely rare, but, as shown by de Schweinitz and Thomson,² it may occur. Their case was that of an epileptic who showed signs of slowly-advancing neuritis for three years. With full vision there was no limitation of the field. Under observation the swelling increased to 6 D. In three months after trephining over the right motor-centers the swelling began to subside and vision to diminish. Degenerative changes closely resembling those seen in renal retinitis appeared in each macula. Urine-analysis was negative. One year later the swelling returned (6 D.), with complete atrophy of the nerve-heads, headache, vomiting, and other symptoms of intracranial disease.

An unusual reflex cause of optic neuritis is assigned by Panas,³ in a man

¹ Wien. Med. Woch., Dec. 25, 1894, Ref. Oph. Rev., Mar., 1895.

² Arch. of Oph., April, 1895.

³ La Presse Médicale, Feb. 23, 1895, Ref. Practitioner, London, May, 1894.

of twenty-six, "robust but anemic," who had never had syphilis, rheumatism, or an eruptive fever, but with a chronic relapsing gonorrhea of several years' duration. There was concentric limitation of the visual field and an absolute scotoma of the lower and inner part. The ophthalmoscope revealed typical, simple papillitis. He concludes "that the seat of the lesion is not intracranial, because the pupil-reflex is preserved without myosis, mydriasis, or inequality; it is not a meningitic lesion at the base, for there has been no fever, no headaches, no bilateral amblyopia, nor ocular paralysis. We must therefore look for the origin in the spinal cord."

The connection between middle-ear complication and optic neuritis as cause and effect, with cure by operation on the mastoid region, is shown in a case of Rakowicz. In consequence he advises¹ in all cases of purulent otitis of the middle-ear that the eye-grounds should be repeatedly and carefully examined to determine if intracranial involvement exists. In his case a radical operation was performed and the diplopia disappeared in twenty-four hours, and in six days both papillæ became normal. There was probably a low-grade meningitis involving the sheaths of the optic and abducens, and, the pressure being relieved, the symptoms rapidly disappeared.

Three cases of cure of optic neuritis are reported by Taylor,² following successful operation for the removal of tumors.

Inflammation of the tissue of the optic nerve causes anomalous and unclassified fields according to the portion of the nerve involved and the intensity of the inflammation. Ogilvie³ cites an illustrative case of double optic neuritis with peculiar visual fields in a nervous man of fifty-seven, a sorter of cigars and a moderate smoker; the pupils acted sluggishly to light, there were eccentric fixation and vitreous opacities, the discs were pale, and the veins tortuous. The right field was contracted for colors and white, and a sector down and in was absent. There was contraction of the left field and complete inferior hemianopsia. The urine contained no sugar or albumin and there was no history of syphilis or alcoholism. This was the second attack of neuritis. Fourteen months later the upper and inner half of the right field was missing. The explanation should be sought in the inflammation of the optic nerves and not in the cerebrum.

Snell⁴ describes a case of optic neuritis in a man of twenty-four, with congenital amblyopia, without abnormal ophthalmoscopic appearance, who had two brothers and two sisters similarly affected.

Optic Atrophy.—Hereditary atrophy of the optic nerves is in some cases traceable to inherited syphilis,⁵ and is amenable to treatment by mercury and the iodids. In others no cause is assignable and the prognosis is bad. The neuritis and perineuritis eventually become gray atrophy.⁶ Iodid in

¹ Klin. Monatsbl. f. Augenh., May, 1895.

² Oph. Rev., Mar., 1895.

⁵ Vignes, Rec. d'Oph., Sept., 1894.

² Ann. d'Oculist., July, 1894.

⁴ Brit. Med. Jour., Nov. 24, 1894.

⁶ König, Arch. d'Oph., July, 1894.

large and increasing doses is useful in atrophy arising from various causes, according to R. L. Thomson¹ and Kollock.² Kollock prescribed 300 gr. daily in the case of a young lady, five years after the commencement of loss of vision following a fall on the back of the head. Vision improved from $\frac{4}{200}$ to $\frac{15}{100}$.

The influence of heredity is exhibited in cases of R. L. Thomson,³ in which three black-eyed children born of a blue-eyed father and a black-eyed mother became blind at six and eight years of age. One blue-eyed and one brown-eyed child had good vision at twenty-one and thirty years of age.

Embolism.—A case of embolus of a branch of the retinal artery with absolute scotoma and partial recovery, as observed by Carl Kunn, furnishes clinical evidence of his assumption that the circulation is in these cases not entirely shut off.⁴ The upper temporal artery just above the disc was occluded by a clot from an unknown source, and appeared to be empty for a space equal to twice the diameter of the vessel. At that point the artery assumed its normal caliber and appearance. Pressure on the ball demonstrated that the current of the blood was not altogether abolished at the site of the clot, as under increase of tension it was restored. This explanation is more reasonable than that of collateral circulation. An absolute scotoma existed at the fixation-spot. In a few weeks the clot had become absorbed and the scotoma disappeared, the ophthalmoscope showing that the circulation had been reestablished at the site of the clot. The author has proved to his own satisfaction, by microscopic work, that the foveal region is not devoid of bloodvessels, as stated in the text-books, but that they can be followed—arising from the main artery and not from the retinal branches, “Macular Vessels,”—as far as the fovea. In this opinion he is supported by Jaesche.⁵ In a case of embolism of a stem of the artery, a clot, probably due to massage of the body of the patient, at first completely occluded the vessel, but later allowed the passage of a small stream of blood; partial recovery followed. In most cases, however, of embolism of the artery blindness is permanent, as in Oliver’s case,⁶ in which the pupil was undilated and fixed, media clear, and the fundus-details those of optic atrophy, with gross perivasculitis and retinal degeneration.

The study of Würdeman’s paper⁷ will show the clinical and pathologic distinctions between embolus and thrombus. In a boy of eight, otherwise seemingly well, there suddenly appeared, without assignable cause, complete blindness of the left eye, the right remaining normal. When seen four days after the initial symptoms the ophthalmoscope revealed a striking picture of thrombus with many retinal hemorrhages. A month later there

¹ Arch. Oph., July, 1894.

² Trans. Am. Oph. Soc., 1894.

³ Arch. of Oph., July, 1894.

⁴ Wien. Med. Woch., Aug. 25, Sept. 1, 1894.

⁵ Arch. of Oph., July, 1894.

⁶ Internat. Med. Mag., Jan., 1895.

⁷ Arch. of Oph., Oct., 1894.

was partial absorption of the extravasated blood and the arteries were reduced to mere connective-tissue streaks. About a year later, after several inflammatory attacks, accompanied by intense pain, he again reported with the anterior chamber practically obliterated and unmistakable signs of acute glaucoma. After enucleation the microscopic sections showed clearly the antecedent process of phlebitis and thrombosis, with resultant perivasculitis and consecutive atrophic changes. There was extensive proliferation of connective tissue in the retina and vitreous, with "fibroid degeneration of the various structures, resulting in occlusion of the lymphatic channels and glaucoma."

Tumors of the Optic Nerve, according to Schneidemann,¹ are characterized by irregular defects in the field, advancing to total blindness, proptosis, limited rotation of the ball, optic neuritis, and atrophy of the nerve. Occasionally, cure follows the administration of large doses of potassium iodid. In the reported case, ten months after infection vision was suddenly lost in one eye. The ophthalmoscope showed a prominent nodule from 5 to 6 D. high, circumscribed, wide-based, of yellowish-gray color, without fine stripes or other characteristic structure. The neighboring retina was swollen, the arteries very fine, the veins tortuous; on the edges were small hemorrhages. Under antisyphilitic treatment the growth disappeared, leaving a discolored and ill-defined disc. That section of the field only was preserved which corresponded to a part of the retina that was seen to be well supplied with blood. Upon recovery there was an absolute central scotoma and vision of $\frac{1.5}{100}$. In the other eye there was a moderate degree of neuroretinitis, but no appearance of gumma.

Microscopic examinations are rarely reported, and therefore that of Finlay² deserves extended notice. His patient was a woman of fifty-five, with exophthalmos of 2 cm., intense swelling of the optic nerve, and complete blindness. Upon removal, the tumor was found to be cylindric, with the nerve as the axis, and protruding 5 mm. into the ball. Histologically, it consisted of spindle-cells and dense septa, extending from the sheath into the nerve, dividing the growth into alveoli densely packed with cells. In places, the cells were concentrically arranged around bloodvessels permeating the tumor. In the intraocular portion the cells were of two kinds—large round, and smaller oval, bipolar, the intercellular substance occupied by granular matter, and abundant fibrillar network proceeding from the cell-processes, with a plentiful admixture of brown cells and leukocytes. The choroid was not involved. That part of the growth bordering on the vitreous showed signs of myxomatous degeneration. In one place an extension into the neighboring orbital cellular tissue at the point of exit of a bloodvessel was noticeable, the thickened walls of which, as well as the immediately surrounding cellular tissue, were infiltrated with sarcoma spindle cells. Of 117 cases

¹ Graefe's Arch. f. Oph., Bd. xli., Abt. 1, 1895.

² Arch. Oph., April, 1895.

collected by the author, extension of the growth into the interior of the ball is mentioned in only 4. Operative interference is demanded as soon as the diagnosis is made. The eye-ball should be preserved when the intraocular end of the nerve is not involved, and when its retention does not interfere with the field of operation.

Braunschweig's ¹ views upon the subject of tumors are briefly as follows :—There is a slow and painful progression of proptosis with early and complete loss of sight from atrophy of the optic nerve. The tumors are mostly myxosarcoma. The prognosis is moderately favorable if early and complete eradication is practised. He recommends section of the nerve, leaving the ball in place [but as atrophy usually follows this difficult operation, enucleation or exenteration should be preferred].

Functional Disorders of Vision.—Night-blindness, an early symptom of retinitis-pigmentosa, is said by Romano-Catania ² to be a disturbance of "adaptation" of the retinal cells while the light-sense is normal. [It seems to us that this is a distinction of terms only.] Marlow ³ reports a case of retinitis pigmentosa with extreme contraction of the visual fields without night-blindness. Constant exposure to a bright color, such as the soldier's red coat, is believed by Beaumont ⁴ to be a cause of retinal hyperesthesia, and to be relieved by green glasses. According to Mackey, it is not uncommon, after an eclipse, to find cases of central retinochoroiditis in persons who have gazed persistently at the sun. In Duane's case ⁵ the scotoma was absolute and had persisted for thirteen years, gradually decreasing in size but retaining its shape, which was that of the sun with a part of the periphery cut off. The same patient had "revolving hemianopsia" of the diseased eye beginning below, going to the temporal side, then upward, and finally to the nasal side, the line of demarkation being exactly vertical or horizontal, lasting for ten or fifteen minutes; in the blind field were bright lines and lights. Barrett ⁶ reports a case of small persistent scotoma due to retinochoroidal macular changes from the same cause. The prognosis in such cases is favorable for improvement, but not for full recovery.

Sachs ⁷ had the rare opportunity of observing for a period of three months a case of central color-scotoma of both eyes with marked improvement both in vision and color-perception in the affected area, and finally of making an autopsy and a minute microscopic study of all the parts involved. [The thorough manner in which this latter work was done has given us a most valuable contribution to the pathology of retrobulbar neuritis.] The patient had the small, laterally-excentric, and oval scotoma commonly found in toxic amblyopia and other diseases affecting the papillomacular bundle of fibers and

¹ Graefes Arch., vol. xxxix., Abt. 4.

² Arch. di Ottol., vol. i., Fasc. 5-9, 1893-1894.

³ N. Y. Med. Jour., Feb. 17, 1894.

⁴ Brit. Med. Jour., Sept. 15, 1894.

⁵ Arch. of Oph., Jan., 1895.

⁶ Oph. Rev., Mar., 1895.

⁷ Arch. of Ophthal., Oct., 1894.

usually extending horizontally from 1° to 8° in a lateral direction from the fixation-point but not involving it. The sections demonstrated the somewhat tortuous course of this bundle of atrophic fibers. They formed a concavo-convex meniscus with its convex surface near the optic nerve-sheath at the temporal border of the first section made immediately behind the eye-ball, but more nearly oval and found nearer the center in a section made at the apex of the orbit. Atrophic fibers were found in the nerve layers of the retina, and in the sections through the chiasm and optic tracts atrophic areas were also found. No disease of the brain could be discovered. There was well-marked areolar hypertrophy in the sections behind the lamina and very pronounced axial connective-tissue, decreasing toward the apex of the orbit. The coarser connective-tissue spaces presented many capillaries, and there were some isolated hemorrhages, but stress is laid on the fact that in the anterior portion there was no cellular infiltration, and that in the sections at the orbital opening of the optic canal, the adventitia of the vessels was so infiltrated with cells that the vessels could not be made out with the naked eye, owing to the intensity of the hematoxylin stain. The conclusion is that the posterior central vein was the site of the morbid process.

Ramsey¹ records the history of an interesting case of tobacco amblyopia that was finally followed by narrowing of the general visual field and typical central scotoma. The patient persisted in moderate use of tobacco, and, in spite of treatment continued for a long period, made only an imperfect recovery. The author does not accept DeWecker's pathology, that all cases of toxic amblyopia are due to retrobulbar neuritis. Adamük² divides optic neuritis into complete and partial, the latter variety being subdivided into peripheral (perineuritis), central (axial), and scattered (disseminated). The diagnosis of perineuritis is determined by limitation of the visual field, and of the axial variety by central scotoma. [According to this classification Ramsey's case combined both forms. This is often the condition of advanced stages of toxic amblyopia.]

GLAUCOMA.

Etiology.—Among the important contributions of the year to the study of glaucoma, the articles of Galezowski,³ from their thoroughness and suggestions, may be fairly accorded first place. He considers glaucoma to be due to an alteration of nutrition through an obliteration of the lymph-vessels and distention of the lymph-canals, plastic exudation around the canal of Schlemm, hyaline degeneration of the walls of the vessels of the iris, rigidity of the lamina cribrosa, and concentration of lymph at the entrance of the optic nerve. Iridectomy, he says, is the safest and surest cure for acute

¹ Lancet, May 11, 1895.

² Graefe's Arch. f. Augenh., Bd. xxxix., Heft 2.

³ Rec. d'Oph., July, Aug., 1894.

cases, but for chronic ones he recommends repeated sclerotomies, involving, in several operations, the entire circumference of the cornea, performed by means of a special knife, sickle-shaped and 4 mm. wide in the center.

Oliver's¹ cases illustrate the disastrous effects of extravasations of blood on the normal ocular circulation and their tendency to develop glaucoma. In one case, after two iridectomies at intervals of some months, a cataractous lens was extracted with good result.

Artificial glaucoma has been produced experimentally by Knies.² His experiments were on dogs, and the substance injected was generally oil of turpentine, olive oil, or a mixture of these substances in varying proportions. If we exclude glaucoma simplex, which is only an optic-nerve atrophy with a large physiologic excavation, and should not be included under the category of glaucoma,³ glaucoma is an iridocyclitis in which the anterior channels of outflow of the eye are occluded, temporarily at first, permanently afterward, the permanent occlusion being due to adhesion of the periphery of the iris to the cornea, a condition which in advanced stages is never absent. [It is hoped that with the results here given, the theory of the neurotic nature of glaucoma has been permanently done away with.] Berberich⁴ has reached similar conclusions by different experimentation. He shows that the theory of the closure of the filtration-angle as the direct cause of glaucoma is correct. By inducing a keratoiritis, by which the angle of the anterior chamber was occluded, a true excavation of the optic papilla was produced.

The **Halo-symptom**, or the seeing of colored rings around lights, an early and important indication of on-coming glaucoma, is explained by Richey⁵ on the assumption of changes in the media of the eye, or, as stated by Willets,⁶ by stasis and edema of the cornea, and is analogous to the lunar halo, which is unquestionably due to alterations in the atmosphere. Its appearance in comparatively low tension is dependent upon the non-absorption of the edema from a previously high tension, and its nonappearance in very high tension, to the naturally increased edema causing a coalescence of the beads of fluid under the epithelial layer, thus destroying the proper relation of refraction, without which the colors could not be produced.

The influence of heredity as a cause of glaucoma is discussed by Priestley Smith,⁷ who measured the diameters of the cornea in a father and daughter, the subjects of glaucoma, and found them exceptionally small—10.5 and 10 mm.—to which condition he ascribed the disease. In one eye excised

¹ Trans. Am. Oph. Soc., 1894.

² Arch. of Ophthal., April, 1895.

³ Gould and Hewish, Med. News, Nov. 24, 1894. "A Case of Glaucoma Simplex Uninfluenced by Eserin and Iridectomy."

⁴ Graefe's Arch. f. Oph., Bd. xl., Abt. 2, 1894.

⁵ Ann. of Oph. and Otol., July, 1894.

⁶ Ann. of Oph. and Otol., Jan., 1895.

⁷ Oph. Rev., July, 1894.

from the daughter the chief points of importance in the microscopic examination were, the subnormal dimensions of the cornea and globe and the relatively large size of the lens, and the closure of the filtration-angle.

Glaucoma after Cataract Operations has been studied by Pagenstecher,¹ who finds that there are two groups, those in which the glaucoma-process is the direct result of the extraction-operation, and those in which it appears some time after the eye has regained its function. The former cases are not uncommon, the affection appearing in an eye two or three days after extraction—generally after the use of atropin—that has never shown indications of the disease. The treatment should be rest in bed, dry heat, sodium salicylate, eserin, or pilocarpin. Recovery is usual in a few days. Relapses are likely to occur. In the latter group of cases it arises in the second, third, or fourth week, particularly when abnormally low tension follows the operation. Sometimes it accompanies an iritic process. The cause may be in retained cortical masses, or by the healing in the wound of a piece of capsule. It is more frequent in the simple than in the combined operation. Prognosis is favorable excepting in iritis, or when the symptoms of glaucoma were prominent before the operation. Some cases undoubtedly follow the routine use of atropin. Glaucoma after discission is not infrequent, appearing in a few hours. It is best treated by puncture of the anterior chamber by means of a small double-edged knife through the corneoscleral border instead of through the cornea. All forms of glaucoma may occur in aphakia and long enough after the extraction to be properly considered as a fresh disease.

Eserin in the Treatment of Glaucoma is emphasized by Cohn² as of special value in the periodic stage, and is well borne by all glaucomatous subjects. The appearance of the rainbow-symptom, which should, in all cases of suspected glaucoma, be eagerly sought for, is an indication for its employment. In an acute attack it is to be instilled every hour until recovery ensues, generally in one or two days. In chronic cases it may be continued one year or more without injury, provided the solution and the pipette are sterilized.

Electricity is recommended by Pilgrim,³ whose experience is unique. He reports 3 cases cured by mild galvanism. He places a cathode or negative pole against the eye. Reversal of the anode and cathode increased in one case the symptoms. There was no return in any case after a year, and the results were as good or better than could be expected from iridectomy.

Iridectomy.—Collins⁴ believes that when iridectomy fails to cure glaucoma, it is because the iris is not cut at its extreme periphery, the portion remaining blocking up the filtration angle, or from adhesion of the lens-capsule to the wound, or prolapse or adhesion of the ciliary processes through the cicatrix.

¹ Klin. Monatsbl. f. Augenh., May, 1895.

² Ann. Ophth. and Otol., April, 1895.

² Berl. klin. Woch., May 27, 1895.

⁴ Lancet, 1894, No. 21.

SERIOUS INJURIES OF THE GLOBE.

In the treatment of serious injuries to the globe enucleation must be reserved until all other means have failed and vision is irretrievably lost. Pieces of iron and steel are in many cases successfully extracted by the electro-magnet,¹ that devised by Hirschberg being preferred. They are, as a rule, easily extracted when embedded in the lens. The traumatic cataract should be allowed to mature for several months, when the lens and foreign substance may be removed. In the case of perforating wounds the removal of the lens instead of the enucleation usually advised, will often result in the recovery of useful vision. The proper time to perform the extraction is in the first week after injury. At a later date inflammatory adhesions form between the anterior capsule and iris that prevent the best result from operation because of retention of part of the lens-substance.² Another reason for early extraction is to prevent adhesion of the incised corneal edges to the swollen lens-mass. The prognosis is not unfavorable when the foreign body is in the anterior chamber, as it can be more readily extracted either by iridectomy or by the magnet than if it is in the vitreous. A prolapsed iris (unless very recent, when it may be replaced) should remain and be allowed to slough off.³ The position and direction of wounds of the capsule depend upon the character of the injury and of the substance producing it. As a rule, moderately large tears do not heal. Small wounds produce opacities of the adjoining lens-substance, which may clear, remain unchanged, or involve the entire lens. Sometimes a projecting layer of fibrin is excreted by the lens, which, covering the wound, shields the lens. A layer of epithelial cells forms over this membrane.

Adler⁴ reports a case of fracture of the superior maxillary, in which the dislocated bone-fragment of the lower orbital border, through pressure on the inferior maxillary and counterpressure on the skull, caused subconjunctival rupture of the left eye. Webster⁵ records the brilliant result of several operations in two cases of destruction of vision by foreign bodies. Several needle operations were made in a cataractous lens, and later a dense membranous cataract was extracted. One eye of the patient, a man of twenty-three, had been enucleated. Vision in the other was restored to $\frac{2}{3} 0$ with plus 10 D., and nine years later to $\frac{2}{2} 0$ by an additional astigmatic correction.

¹ Knapp, *Arch. of Oph.*, July, 1894. Goldschmidt, *Deutsch med. Woch.*, Nos. 3, 4, 1895.

² Randolph, *Med. Rec.*, Feb. 23, 1895. *Oph. Rev.*, April, 1895.

³ Taylor, *Jour. Am. Med. Assoc.*, Sept. 15, 1894.

⁴ *Wien. med. Woch.*, No. 6, 1895.

⁵ *N. Y. Med. Jour.*, Oct. 20, 1894.

SYMPATHETIC INFLAMMATION.

The Interval of Time between an injury to one eye and the development of sympathetic inflammation in the fellow-eye is extremely variable. Hirschberg¹ records the case of a child six years old, who received an injury in the ciliary region of one eye, and six weeks later the uninjured eye presented signs of sympathetic inflammation, and in five months "typical fundus changes," very small, round, bright spots in the periphery, were abundant behind and near the branching of the vessels, with vitreous opacities. The longest period reported during the past year was forty-two years, from a shrunken eye-ball, lost by corneal ulceration following an attack of variola.² As the author says, "the case is of value as being one in which the sympathetic inflammation followed some forty-two years after the destruction of an eye which had suffered from a nontraumatic type of suppuration of the cornea." He believes that the exciting cause must have come from within.

Etiology.—Different causes are assigned: Injury by a piece of wood in the ciliary region, traumatism from a kick eighteen years before, in which there was no rupture or external wound to be found, but the ball was disorganized and the seat of purulent disease.³ Similar cases in which there were no channels of communication from without to the interior of the ball tend to speak strongly against the theory of microbic origin.⁴ In confirmation of the microbic origin, the anatomic result of two cases, one arising from *cysticercus intraocularis*, is cited by Pincus.⁵ From the microscopic findings of these two cases the reporter concludes that irritation of the ciliary nerves will not produce a sympathetic inflammation, but that an immigration of micro-organisms is necessary. He favors the Leber-Deutschmann migration-hypothesis. Fiem⁶ calls attention to the fact that symptoms of sympathetic ophthalmia may arise in patients subject to nasal disease, and claims to have cured three such cases by treatment of the latter affection.

Foreign bodies of various kinds may find lodgment in the interior of the eye. The following have been reported:—A piece of coal was discovered in the vitreous six years after its entrance.⁷ A cilia caused repeated attacks of irritation for twelve years, when it was removed by iridectomy.⁸ Pieces of glass in the anterior chamber excited chronic interstitial keratitis, and were extracted one year after entrance.⁹ Stoermann¹⁰ reports a case in which caterpillar hairs had perforated the cornea and passed into the anterior chamber.

¹ *Centralbl. f. prakt. Augenh.*, Mar., 1895.

² Weeks, *N. Y. Eye and Ear Inf. Reports*, Jan., 1894.

³ Wilson, *Trans. Am. Oph. Soc.*, 1894. ⁴ Bronner, *Oph. Soc. Unit. King.*, July 6, 1894.

⁵ Graefe's *Arch. f. Oph.*, Bd. xl., Abt. 4, 1894. ⁶ *Ann. d'Oculist.*, Oct., 1894.

⁷ Stewart, *N. Y. Med. Jour.*, Sept. 22, 1894.

⁸ Leviste, *Ann. d'Oculist.*, Oct., 1894.

⁹ Wagenman, *Graefe's Arch. f. Oph.*, Bd. xl., Abt. 5, and Perles, *Berl. klin. Woch.*, July 9, 1894.

¹⁰ *Inaug. Diss.*, Berlin, 1894.

A splinter of copper was found by Goldzieher ¹ lying on the retina ten years after it had perforated the cornea and lens. It had occasioned no irritation and but little disturbance of vision ($\frac{2}{3}$ °). Traumatism of the conjunctiva and cornea may readily happen in these days of spectacle-wearing.² Oliver ³ gives the clinical history of a case of successful extraction of a piece of steel from an iris in which purulent inflammation had been established. Prompt subsidence of the inflammatory reaction and full restoration of vision followed an iridectomy.

Effects other than sympathetic ophthalmia occasionally follow injuries and the entrance and lodgment of foreign bodies, such as tetanus ⁴ and amaurosis from concussion or compression of the optic nerve.⁵ The ocular manifestations of tetanus are ptosis, spasm of the orbicularis, myosis, diplopia from spasm or paralysis of the third, fourth, or sixth nerves, and increase of refraction and amblyopia,—[all of which are, in our opinion, due to the poison of infection].

The prognosis depends more upon the part injured than upon the character of the material inflicting the injury or the foreign substance lying within the ball.⁶

THE EYE IN SYSTEMIC DISEASES.

The value of the study of the eye in relation to general diseases can not be overestimated. One of the most valuable contributions upon the subject is the work of Max Knies.⁷ An analysis of this excellent work would require too much space, for notice of individual parts could scarcely do more than give an imperfect conception of its value to the ophthalmologist and general physician.

In an article quoted from *L'Union Médical*, upon the influence of general maladies upon the organs of vision, by Professor Panas,⁸ we have the views of this acute observer on some of the most important questions that arise in dealing with diseases of the eye. He calls attention to the important distinction between those hemorrhages of the retina due to a cardiovascular affection and limited to the posterior pole, unaccompanied by a lesion of the papilla and generally unilateral, and those due to a dyscrasia, such as albuminuria; these are generally bilateral and more diffuse. In diabetes he ranks the ocular changes in the order of their frequency as follows: cataract, optic neuritis, and hemorrhagic retinitis, the lesion of the optic nerve being a descending neuritis having its point of departure in the encephalic centers.

Albuminuric Retinitis.—It has been thought by some authors that the

¹ *Centralbl. f. prakt. Augenh.*, Jan., 1895. ² Pinkard, *Ann. Oph. and Otol.*, July, 1894.

³ *Univ. Med. Mag.*, May, 1894.

⁴ Fromaget, *Arch. d'Oph.*, Nov., 1894.

⁵ *Nettleship. Oph. Rev.*, April, 1895.

⁶ Hobby, *Ann. Oph. and Otol.*, Oct., 1894.

⁷ English Translation by Noyes, N. Y., William Wood & Co., 1895.

⁸ *Am. Jour. of Oph.*, Nov., 1894.

changes in the retina closely resembling those of albuminuria are really due to the often-intercurrent diabetes. According to Dodd¹ the changes consist of minute hemorrhages, and small, bright, glistening spots of degeneration, nodular and irregular in outline, seldom stellate, around the macula, never coalescing or covering a large part of the fundus. The vessels are usually of normal size and contour, and active inflammatory signs are wanting; embolism and thrombus may be present in the late stages when endocarditis is not uncommon; there may be opacities in the vitreous in the hemorrhagic form, but their source cannot be traced. The subjective symptoms preceding diabetic amblyopia are, moderate disturbance of vision, photophobia, photopsia. Primary atrophy of the nerve frequently follows the retinitis. The important pathologic changes are in the small bloodvessels, consisting in partial closure and rupture. In the differential diagnosis one of the principal forms is characterized by spots of degeneration, alone or mixed with hemorrhages, and the other by hemorrhage alone; there is alteration of the papilla, conducive later to atrophy, but there is no optic neuritis, as there is in albuminuria; diabetic retinitis is frequently monocular; the spots are nodular and irregular. The appearance of retinal changes in the course of diabetes does not necessarily mean that the prognosis is more grave. The treatment is that of the cachexia combined in the early stages with antiphlogistic remedies, and, later, eserin, injections of pilocarpin, collyria of sodium iodid and potassium iodid in one per cent. solution.

Affections of the Liver, particularly those accompanying icterus, may cause either hemorrhages or retinitis. The causative connection of diseases of the liver with affections of the eye has been ably considered by Baas.² In jaundice the yellow pigmentation of the conjunctiva and sclera is recognized before that in other mucous membranes, because of its transparent unpigmented nature. No connection has been positively traced between affections of the liver (cirrhosis) and the yellow spots known as xanthelasma. Their color is not due to deposit of bile, but to a fatty degeneration or infiltration of the skin. Landolt's assertion that retinitis pigmentosa is induced by cirrhosis of the liver or kidneys is not substantiated. White patches in the retina found to consist of fatty degeneration are not infrequently associated with similar patches in parenchymatous organs, and may be considered as part of one process. Hemorrhages in the retina are undoubtedly due in some cases to liver-disease from diapedesis of the red blood-corpuscles rather than to rupture of diseased vessels. Hemeralopia and xerosis of the conjunctiva are not infrequently caused by chronic liver-disease (cirrhosis), as is well shown by the author's observation of a case for two years during life and the anatomic examination after death. In infants, acute jaundice may give rise to keratomalacia fatal to the integrity of the ball. Thompson³ reports such

¹ Arch. of Oph., April, 1895.

² Münch. med. Wochenschr., Aug. 7, 1894.

³ Brit. Med. Jour., Sept. 15, 1894.

a case. The child died two weeks after the discovery of the corneal affection. Serous iritis Thompson attributes without hesitation to the rheumatic diathesis.

The Uric-Acid Diathesis.—Bergmeister¹ includes among the diseases of the interior of the eye that may arise from the uric acid diathesis posterior polar cataract, vitreous opacities, neuroretinitis, and hemorrhages into the retina.

Rheumatism.—What is termed “blennorrhagic metastatic ophthalmia” (gonorrheal iritis) Bergmeister² attributes to the presence of the rheumatic diathesis in a subject of blennorrhagia. “In order that patients may present articular or ocular accidents, it is necessary that they be rheumatic or within the power of the action of rheumatism. Blennorrhagia is but the occasion which is presented for the display of these phenomena, and it awakens the diathesis.” In latent rheumatism in a patient with chronic blennorrhagia, when the seat of the disease is at the neck of the bladder and is no longer in the ordinary sense contagious, a simple catheterization may be the point of departure for hydrarthrosis of the knee, as the action of cold may occasion rheumatic affections of the eye when the neck of the bladder has been attacked. An arthritic predisposition is, in the opinion of the author, the underlying cause of eczema and of those forms of conjunctivitis that at times are produced by the instillation of atropin and eserin.

Diphtheria.—Coppez³ gives a detailed account of the process of repair following the use of antitoxin-serum. The false membranes disappear more or less rapidly and leave behind them healthy tissue. The author believes that by the injections of antitoxin we are in a fair way to check the invading progress of pseudomembranous exudates. At least, the last two stages of the malady may be suppressed, with all the dangers that accompany them. If treatment is begun at the proper time it will not be forty-eight hours before all menacing symptoms have disappeared. Jessop⁴ also describes two cases of pseudomembranous conjunctivitis of undoubted diphtheric character, as shown by the presence of the Loeffler bacillus. After a few injections of 4 g. each of Klein's antitoxin the false membrane disappeared, in one case in three and in the other in four days. No local treatment was employed other than cleansing the eyes with distilled water. [The testimony of numerous other observers tends to establish for antitoxin a most important place among our therapeutic agents, but it is by no means determined that we have as yet learned what are the limitations of its usefulness.] Lantcheere⁵ reports a case of characteristic conjunctival diphtheria, in which the conjunctiva is described “as seemingly as hard as wood,” which was benefited by injections of antitoxin serum, although in cultures and on repeated microscopic exami-

¹ Wien. med. Wochenschr., Nos. 42, 43, Oct. 13, 20, 1894.

² Loc. cit.

³ Jour. de Méd. et d. Chir. d. Bruxelles, Nov. 24, 1894.

⁴ Ann. d'Oculist., Feb., 1895.

⁵ Ann. d'Oculist., April, 1895.

nation only streptococci were found. [This case confirms the opinion of Landouzy, who has already noticed the curative effect of serum in tonsillitis with streptococci pure and simple. This is worthy of consideration when we remember that it is usually in association with the other forms of micrococci that the diphtheric bacilli seem to be most virulent.]

That other means may accomplish the same object is well illustrated by the case of Fraenkel,¹ of a child of four, in which the membranes examined bacteriologically showed the presence of Loeffler's bacillus. Inoculated on glycerol-agar, colonies grew in some eighteen hours. There was albumin in the urine. No sign of diphtheria existed elsewhere. The condition completely disappeared by silver-nitrate treatment. Uhthoff² contributes 4 cases of conjunctivitis that had the clinical features of croupous conjunctivitis, but bacteriologic examinations showed the presence of bacteria of diphtheria. The cultures from the streptococcus and staphylococcus injected into the abdomens of Guinea-pigs and rabbits produced death, and into the conjunctival sac, diphtheric conjunctivitis. The second part of this valuable contribution concludes with the important practical advice that all suspected cases should be examined for the bacillus, and when found the patients must be quarantined.

The belief prevails that Loeffler's bacillus causes only diphtheric conjunctivitis, but, as is shown by Schirmer,³ it may cause other forms of conjunctivitis. All the cases (8) had the appearance and properties of the croupous form, and each was developed by virulent diphtheria-bacilli, and in some cases with the coexistence of throat-diphtheria. In 4 cases the throat was deeply ulcerated, thus affording a lodging place for the bacilli.

Tuberculosis.—The theory of the influence of tubercular infection in the development of diseases of the anterior section of the eye has received strong confirmation. Bach⁴ presents evidence to establish the position, long maintained by Michel and others, that tuberculosis is a much more frequent etiologic factor in eye-diseases (particularly of parenchymatous, sclerosing keratitis, and iritis) than is generally supposed. The author lays stress upon the following:—1. Tuberculosis of the eye is by no means a rare affection. 2. All parts of the eye may be attacked by the disease. 3. It plays a particularly important role in diseases of the uveal tract. 4. The eye-diseases may be the only or earliest manifestations of the tuberculous infection. [When one remembers how often he is unable to trace either a rheumatic or syphilitic cause for inflammation of the iris, there is food for thought in the author's statement that in an experience of seven years he had found iritis as often of tuberculous as of syphilitic origin.] The author reports three cases of probably primary infection of the cornea and ligamentum pectinatum, and he thinks that in cases of general tuberculosis the cornea is often

¹ Practitioner, London, Dec., 1894.

² Berl. klin. Woch., Aug. 20, 27, 1894.

³ Graefe's Arch. f. Oph., Bd. xl., Abth. 5.

⁴ Arch. of Oph., Jan., 1895.

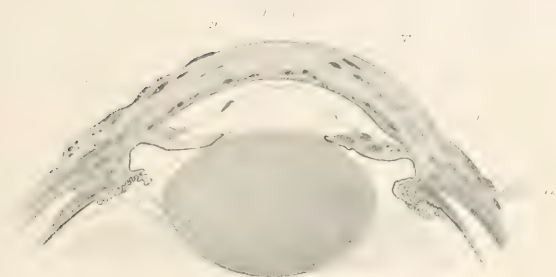


Fig. 1.

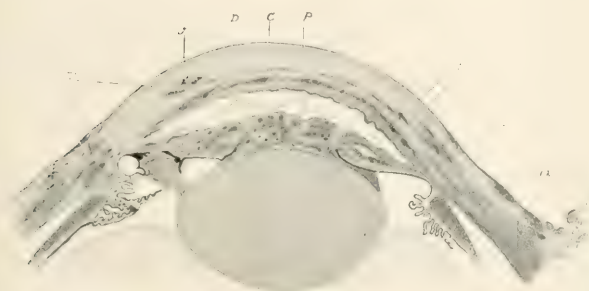


Fig. 2.

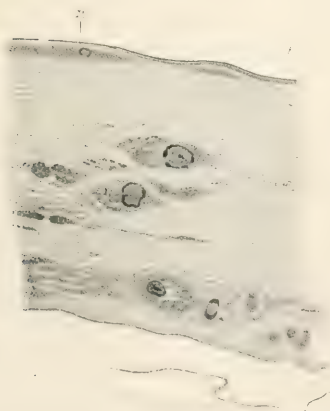


Fig. 3.

Tubercular iritis and keratitis parenchymatosa (Binstenbindel)
(Arch. Oph., Bd. xlii. Abt. 1).



Tuberculous infection of the eye (Bach)
(Arch. Oph., Jan., 1895).

involved. In these views he is in accord with Zimmerman.¹ (See Plate XXVII.)

Buerstenbinder² reports a case of tuberculous knee-affection in a child two and a half years old, followed by tubercle in the iris, and later, following a blow on the head, by the symptoms of brain-tubercle, the origin of which, judging from an analogous case in literature, was by infection through the bloodvessels. He also describes three cases of parenchymatous keratitis in which the diagnosis of tuberculous origin could be safely made, as evidence existed in different parts of the body of that dyscrasia and no signs of syphilis could be determined. In most localities the disease is rare, but in those, where general tuberculosis is rife, it is more common. (See Plate XXVI.)

Clinically, Zimmerman's³ case presented a typical picture of parenchymatous keratitis in a twenty-four-year-old man, and microscopically there was proved pronounced tuberculosis of the cornea, sclera, iris, and conjunctiva, with one doubtful patch in the retina. The ciliary body was secondarily inflamed, the membrane of Descemet was partially detached, and exudation existed between the vitreous and the retina. A neuritis developed later in the disease, probably from infection by toxic material through the vitreous. The cornea was permeated by typical tubercle-patches. The diagnosis is assured from finding bacilli and tubercle cells in 25 sections of the cornea. There were no general physical signs of tuberculosis and no history of heredity of the same. The case also illustrates a secondary and not primary involvement of the cornea, the commencement of the affection being traced to the outer scleral border, whence the cornea became infiltrated, probably through propagation of the tubercle to the iris by the aqueous after the rupture of nodes in the angle. The simple iritis is to be explained by extension of toxins, and this also explains the moderate cyclitis and vitreous opacities. The deposit on Descemet's membrane arose in consequence of the iritis. The conjunctiva was the seat of numerous tuberculous nodes developing in spite of treatment by subconjunctival injections (iodin trichlorid), and may be traced to a rupture of a scleral node into the episcleral lymph-space hastened and disseminated by the injections.

Machek⁴ distinguishes three kinds of tuberculous infection of the iris, and illustrates each form by a case: The miliary variety found in all 3 cases; the larger confluent tubercle in 1; and tuberculous infiltration in the third. The symptoms were:—Moderate photophobia and pain; ciliary injection; loss of normal appearance by the iris; posterior synechia; occlusion of the pupil; deposit on Descemet's membrane. The iris was uneven on its surface and profusely supplied with bloodvessels, whence the variability in depth of the anterior chamber. The swelling of the iris consisted of deposits of tubercle in addition to the products of inflammation. The probability of

¹ Graefe's Arch. f. Oph., Bd. xli., Abth. 1. ² Ibid.

³ Loc. cit.

⁴ Wien. med. Woch., June 19, 26, 1894.

tuberculous disease is strong if the local signs characteristic of seroplastic iridodescemetitis are in association with a phthisical history in a person broken down in health. The prognosis for the life of the patient is improved by early enucleation.

Typhoid Fever.—Berger¹ calls attention to dryness of the conjunctiva appearing in the second week of typhoid fever owing to paresis of the secretory nerves, due to the action of toxins.

Diseases of the Genitourinary System.—Valude² describes a case of iridochoroiditis consecutive to profuse metrorrhagia. The infection, he thinks, came from the lacerated mucous membrane of the uterus. The origin of puerperal panophthalmitis is ascribed by Wood³ to an analogous cause. Autopsies show the frequency of endocarditis, from which it is supposed the colonies of cocci spring. It is probable that the disease may commence in the retina or choroid, or in both simultaneously, or, indeed, in any of the vessels of the eye. Wood calls attention to the mistake made by some writers, who claim that the disease appears first in the conjunctiva, and to the difficulty of determining whether the vessels of the choroid or those of the retina are the seat of the embolic masses.

Typhus Fever.—Adamück,⁴ found among 1138 cases of typhus fever 32 eyes that were affected. The most frequent disease was serous iridochoroiditis appearing in the second or third week of convalescence. Saltini⁵ found in a fatal case of puerperal fever an embolus in an anterior ciliary vessel that had caused iridocyclitis. The posterior part of the eye was relatively normal, presumably from the short duration of the disease. In two cases of epidemic cerebrospinal meningitis, optic neuritis and perineuritis preceded disease of the ball, the infectious process having traveled along the intravaginal to the suprachoroidal space. In a case of infection from vaccination exudative choroiditis with formation of bone was found. Axenfeld's⁶ views on this topic, in the second part of his valuable monograph, are as follows: In the diagnosis of septic embolisms special regard must be had to the circulating microbes and their postmortem increase, as from this cause pictures may develop very similar to those of embolism: in an endogenic pus-formation in the eye the absence of intravascular microbes is no argument against endogenic infection: the violent pyogenic microorganisms leave the vascular walls only in such places as have become permeable by metastatic inflammation, for which reason a metastatic abscess of the cornea without these preceding changes must be thought unproved: the name "metastatic choroiditis" is not comprehensive and should give way

¹ Quar. Med. Jour., July, 1894.

² Ann. d'Oculist., Jan., 1895.

³ Am. Jour. Obs. and Dis. of Women and Children, May, 1894.

⁴ St. Petersburg. Med. Woch., 1894, No. 38 u. 39.

⁵ "Beitrag zu den metastatischen Erkrankungen des Auges," 1894.

⁶ Graefe's Arch. f. Oph., Bd. xl., Abth. 4, 1894.

to the name "ophthalmic meningitis." As clinically the place of infection in the eye can be made out only in rare cases, and as the retina is often the membrane primarily affected, the general name, metastatic ophthalmia, is to be preferred, although the choroid furnishes a great part of the exudate.

According to Berger¹ optic neuritis and paralysis of other ocular nerves may ensue from the absorption of poisonous albuminoid bodies during lactation.

Influenza.—The diseases of the eye that have been noted as sequels of influenza according to Dusseldorf² are numerous, but they present nothing characteristic. They arise directly through parasitic or toxic influence, indirectly by bodily exhaustion and disturbed nutrition, a condition in which diseases or poisons hitherto quiescent find favorable soil for development.

Progressive Paralysis.—The ocular changes and visual disturbance in 44 cases of general progressive paralysis are described by Grosso,³ who found obstinate conjunctival catarrh in 21, unequal pupils in 13, the pupils reacting feebly to light and not at all to accommodation in 15 (they also contracted in size as the disease advanced), incomplete dilatation to atropin in 4, none in 3, unequal in 11. Nothing abnormal was noticed in the external muscles. Vision diminished and color-perception was lost, first of violet, then blue, and lastly red. The field in general became concentrically limited from gradually advancing atrophy of the optic nerves. Doubtless these cases of progressive paralysis can be explained on the assumption of arterial sclerosis.

Arteriosclerosis.—Otto,⁴ in 15 cases of dementia, found microscopic-ally that the optic nerve exhibited alterations in form from pressure by the carotid and ophthalmic arteries, with distortion and partial atrophy of certain groups of nerve-fibers and of the corresponding septa. Sometimes the central and sometimes the peripheral fibers were involved. The nerve-sheath was normal except for a thickening in the proximity of the diseased blood-vessels. Otto attributes the change to a direct compression of the enlarged bloodvessels when the nerves are lying in a bony canal or bound down by a fibrous septum. When the compression is great enough to produce atrophy of the nerve-fibers the lesion can be traced upward and downward in the course of the affected nerve. In the more central portions of the nerve, the disappearance of the fibers is marked. In the more peripheral, the destruction is never complete, and there is found enlargement of the septa, with increase of the nuclei and reduction of the neuroglia. The changes in the central part may therefore be regarded as sclerosis resulting from degeneration. The ophthalmoscopic appearances were abnormal in only one case, in which there was a gray discoloration of the temporal half of the papilla.

¹ Quar. Med. Jour., July, 1894.

² Centralbl. f. prakt. Augenh., Jan., 1895.

³ Ref. Jour. Nerv. and Ment. Dis., Aug., 1894.

⁴ "The Effects of Arterial Sclerosis on the Optic Nerves," Berlin, 1893.

Akromegaly.—A comprehensive summary of the symptomatology and pathology of the ocular affections in akromegaly is given by Hertel,¹ who found thickening of the cartilage and skin of the lids by increase of the lowest layer of the true skin and of its connective tissue; hypertrophy of the glands of the skin; pigment spots; abnormal prominence of the orbital edges and an apparent sinking of the ball; occasionally, on the other hand, there was intense exophthalmos and even luxation of the globe and increase of the orbital contents; hyperplasia of all peripheral nerves, the connective tissue surrounding them being thickened and sclerosed, or softened and degenerated, and also perforated by vessels with thickened walls and diminished caliber; neuralgic pains in the head and eyeball; increased lacrymation; nystagmus; limited movement and actual paralysis of the third nerve, but never of the sixth; sluggish, generally dilated, pupils; diminution of vision; temporal hemianopsia. Enlargement of the pineal gland, especially its anterior section, was found. Two cases are described by others in which the lesion was supposed to be a growth of the wings of the sphenoid with narrowing of the optic foramina and pressure on the nerves. Occasionally there is papillitis, explained by the growth of the pineal gland or by the presence of another tumor. Treatment can be only symptomatic.

Motor Ataxy.—Weir Mitchell² in reporting a case of locomotor ataxy in a child of three years mentions the following eye symptoms: Nystagmus of both eyes and convergent squint of the left, *i.e.*, incoordinate muscular movements such as are seen in other parts of the body. In hysterical ataxy, in contradistinction to the congenital form, both discs are gray, the arteries too small, the veins and pupils normal, the red and blue fields typically reversed, and fields for form contracted. Wagenman³ has reported the microscopic findings in an adult case of locomotor ataxia which first showed a distinct sector of medullated nerve fibers in a nerve that was distinctly atrophic. Ten months later the atrophy had increased and the bundle of medullated fibers had disappeared entirely.

Hysteria.—Leopold⁴ found decided contraction of the color-fields in regular order in a case of marked hysteria with persistent yawning, and Lagrange⁵ ascribed a case of monocular diplopia, in the absence of any error of refraction, to the same disease. DeSchweinitz⁶ recites the history of two cases of monocular diplopia, one of which, unless an instance of extremely clever malingering, illustrates that rare affection. There was vertical diplopia in each eye, ascribed to traumatism (in this instance a railway accident), but without any perceptible structural change in the eyes, and referred to a central cause—the disturbance of communicating fibers between the hemispheres. Lagrange⁷ reports a case of a hysterical girl of twelve,

¹ Graefe's Arch. f. Oph., Bd. xli., Abth. 1.

² Med. News, July 7, 1894.

³ Graefe's Arch. f. Oph., Bd. xl., Abth. 4.

⁴ Codex Medicus, Dec., 1894.

⁵ Jour. de Méd. de Bordeaux, Jan. 6, 1895. ⁶ Tr. Am. Oph. Soc., 1894. ⁷ Ann. d'Oc., Jan., 1895.

who had monocular diplopia with characteristics diametrically opposed to those usually assigned to it, especially by Charcot and Parinaud. She recovered by hypnotic suggestion.

Aphasia, etc.—The subject of optic aphasia, or word-blindness, interesting to the nerve-specialist rather than the ophthalmologist, has been enriched by several contributions, notably those of Bianchi¹ and Campbell.² Closely related to aphasia is the case of cortical blindness reported by Dejerine and Violet.³ The patient became suddenly blind at sixty-four years of age. The pupils, refracting media, and fundus were entirely normal, and continued so until death, four years later. The diagnosis of a double lesion of the cerebral center of vision was made. At the autopsy bilateral softening of the cortex was found in the internal surface of both occipital lobes with secondary degeneration of the bourrelet of the corpus callosum. In the right hemisphere the lesion occupied the cuneate, lingual, and fusiform lobes. In the left, the central portion of the internal surface of the occipital lobe was especially affected. The calcarine fissure was involved in both.

Epilepsy.—In a clinical contribution to the subject of epilepsy Dodd⁴ concludes from his experience that, given a certain condition of instability of the nervous system [whatever that may mean,] errors of refraction may excite epilepsy; their correction in combination with other treatment in many cases will cure or relieve the epileptic condition (48 out of the 100); in some cases after the ametropia has been corrected the epilepsy will continue, modified in consequence of the other irritation, even though the error may have been the exciting cause in the first instance. The state of refraction should be worked out under mydriasis in all cases of epilepsy. Weber⁵ considers the inequality of the pupils, often found in cases of epilepsy, a minor point in building up the objective picture of that disorder. In the treatment of epilepsy by tenotomy of the eye-muscles, [a method nearly obsolete,] Wood,⁶ criticises Ranney's paper claiming cures, and gives his experience,—one that certainly does not justify or support Ranney's contention.

Toxic Amblyopia.—Lydston⁷ gives credit to Samelsohn for having presented us with the knowledge that anatomic investigations in all cases of toxic amblyopia reveal an inflammation of that part of the optic nerve lying within the optic canal; this serves to explain many otherwise inexplicable optic nerve changes, and he suggests, as a better name, retrobulbar neuritis from toxic causes. [As it is not yet fully established that toxic amblyopia, and especially tobacco-amblyopia, is invariably associated with and due to retrobulbar neuritis, it may be as well, for the present, to retain the old name, which, if less exact, is more in keeping with the present state of our knowl-

¹ Berl. klin. Woch., Apr. 2-9, 1894.

² Liverpool Med.-Chir. Jour., 1895.

³ Med. Week., Dec. 15, 1894.

⁴ "Brain," Jour. of Neurology, vol. xvi., 1893.

⁵ Med. News, Aug. 24, 1894.

⁶ N. Y. Med. Jour., July 7 and 15, 1894.

⁷ Chicago Med. Rec., Oct. 1894.

edge of the subject.] Lydston refers to three recent cases in which he was able to define marked retinal ischemia, pronounced pupillary dilatation, together with sluggishness of the pupil under reflex light-stimulus. His patients had horizontally oval scotoma extending from the macula to the optic disc—the maculo-papillary region of the retina.

Nephritis.—The past year has given us a most valuable contribution by Possaner¹ to the study of the prognosis of so-called Bright's disease. By an exacting process of exclusion in an investigation of the histories of 45,000 hospital and 22,000 private cases of all classes of diseases, the author has obtained material for her investigation. After excluding all cases of hemorrhagic retinitis in which albumin was not found in the urine, all cases of acute nephritis and retinitis occurring in the puerperal state, there was left from this immense mass of clinical material (67,000 cases) 65 hospital and 63 private cases. The proportion of cases of chronic albuminuric retinitis to those other diseases, therefore, was in public clinic 1.4 per cent., and in private practice 2.8 per cent. The mortality was greater, and the duration of life after the discovery of the disease less, among patients from the public clinic than among private patients, and among men than among women, both in hospital and in private practice. Of the hospital cases, 72 per cent. died within the first twelve months and 9.2 per cent. died within the second twelve months, making a total of 81.8 per cent. dying within two years. All of the men and 78 per cent. of the women died within two years. The longest period of life after the diagnosis of retinitis was in 1 case six years, and there remain 4 women still living. In private practice the picture was a little brighter, as only 48.7 per cent. died within the first twelve months and 9 per cent. in the second twelve months, making a total of about 58.9 per cent. dying within two years, as against 81.8 per cent. in the hospitals. Sixty-one and five-tenths per cent. of the men and 53.8 per cent. of the women died within two years. The longest period of life after the diagnosis of albuminuric retinitis was made was eleven years,—a woman still under observation with albumin in the urine and typical albuminuric retinitis.

Randolph² recites in detail the clinical history of 5 cases of albuminuria in pregnancy. In one instance the induction of premature labor in the fifth month checked the degenerative process and restored good vision, which, however, was lost in the next pregnancy, the patient having concealed her condition from her physician, owing to her desire to have a child. Premature labor was induced in the seventh month, but vision had already been almost destroyed. In another woman who was practically blind in one eye and nearly so in the other, and whose urine was rich in albumin and contained casts, the induction of premature labor in the fifth month was followed by the restoration of comparatively good health and perfect vision. Her

¹ Beiträge zur Augenheilkunde, Sept., 1894.

² Bull. Johns Hopkins Hos., June-July, 1894.

next pregnancy, a year later, being accompanied in the fourth month by headache and a trace of albumin, a thorough examination of the fundus revealed a retina free from all suggestions of albuminuric retinitis, and she went on to maturity and was delivered of a child without any such development. One of Randolph's cases terminating fatally, opportunity was afforded for the study of its pathologic histology. The optic nerve was practically normal, but there was endarteritis of the central artery with fibrous thickening of the intima. The principal features were: 1. Great edema of the entire retina and, as a consequence, increased depth of the retina; 2. Hyperplasia of the neuroglia, especially marked in the nerve-fiber layer; 3. The presence of hyaline masses throughout the retina, most pronounced in the external molecular layer, and the formation of spaces; 4. As a general thing the changes were more striking near the disc, and this was especially true of the nodules, which here were very prominent, though they were visible along the retina almost as far forward as the ora serrata. The anterior portion of the eye was normal. Fatty degeneration of Müller's fibers, observed by Leber and Theodore, was not seen in this case, though the failure to find this condition does not disprove its existence. Müller's fluid was employed in hardening the eye, and this might account for the failure to detect the changes described by Leber and others, and postmortem changes may also be held responsible.

Silex¹ states that the course of the disease is subacute if it appears in the second half, and acute if it appears in the first half of pregnancy. He believes that the amaurosis does not depend upon the retinitis but upon uremia. Culbertson² cites a case to illustrate the markedly good effects produced by the use of gold bichlorid. [The only compounds of gold are the monochlorid and the trichlorid.] This was followed by rapid diminution of albumin from $\frac{1}{3}$ to $\frac{1}{8}$, and later to $\frac{1}{15}$. Still greater improvement followed at a later period when nitroglycerin, gr. $\frac{1}{60}$, increased to gr. $\frac{1}{50}$, was taken three times a day. Adopting the commonly-accepted theory that albuminuria in pregnancy is due to diminished caliber of the arterioles and enormous increase of blood-pressure in the kidneys, he suggests, early in the course of pregnancy, that this latter remedy be given systematically as a prophylactic. Four cases reported by Webster³ exhibit important differences from those usually described, in that the diagnosis was based on the presence of casts and other abnormal constituents in the urine, but in no case was there albuminuria.

An unusual symptom, violet blindness, is mentioned by Simon⁴ as affecting the central area of the retina, blue and yellow being seen with difficulty, amounting in some cases to actual blue and yellow blindness, while appreciation of red and green remained good. The saturation-perception may be diminished but the tone-perception is unaltered.

¹ Centralbl. f. prakt. Augenh., Feb., 1895.

² Am. Jour. of Oph., July, 1894.

³ N. Y. Med. Jour., Oct. 20, 1894.

⁴ Edin. Med. Jour., Jan., 1895.

Trousseau¹ reports a case in which there were repeated retinal hemorrhages (or hemorrhages between the retina and vitreous²) associated with and, as he believes, traceable to, the causes that produce polyuria. He insists upon an analysis of urine with reference to quantity and all abnormal ingredients, instead of for albumin and sugar alone, in seeking the cause of retinal disease. A case of disease of the retinal arteries due to malarial infection is reported by Despagne.³

GENERAL PATHOLOGY.

The Connection between Congenital Malformations and Diseases Affecting such Eyes has been exhaustively discussed in a series of three lectures by Collins.⁴ The eye is predisposed, by the fact of its congenital defect, to certain conditions, for example, the fetal growth of the lens to coloboma lentis and lamellar cataract. The minute anatomy of the posterior surface of the lens and the origin and course of the humors and secretions also predispose to serous iritis and some forms of choroiditis.

The method of diffusion of pathologic products is discussed in a valuable contribution from Bellarmino⁵ and Dolganoff,⁶ who have made investigations in the eyes of rabbits and conclude as follows: 1. Different pathologic conditions of the anterior part of the eye (especially of the cornea) may either increase or diminish the diffusion of fluids in the interior of the eye. 2. Acute inflammations of the cornea accompanied by tissue-changes (abscess, infiltrate, fresh cicatrix, etc.) increase the diffusibility in proportion to the severity of the pathologic process. 3. Stationary changes of the cornea (degeneration of cicatrices) diminish diffusion in proportion to the size of the cicatrix. 4. An artificial coloboma of the iris has no effect upon diffusion. 5. The increase of the intraocular pressure produces a diminution of diffusion, a fact that explains the small effect of myotics in acute glaucomatous processes. 6. The lens, capsule, intact zonula, and hyaloid offer a great resistance to the diffusion-current from the anterior chamber into the vitreous.

E. von Hippel⁶ limited his consideration to the manner of propagation throughout an eyeball containing a piece of iron of the rust or pigment cells. He believes there is a true siderosis bulbi arising in two ways, either direct from the foreign body or from the blood, the former preferring certain cell groups, such as the epithelium of the ciliary body, pars ciliaris retinae, retina, and lens-capsule.

To Preserve an Eyeball for Microscopic Section.—Krückmann⁷ hardens it in formalin-solution, which is renewed every week for two or

¹ Jour. de Méd., Paris, May 26, 1895.

² Rec. d'Oph., July, 1894.

³ Arch. f. Oph., Bd. xl., Abth. 4, 1894.

⁴ Dimmer, Beit. z. Augenh., 1894.

⁵ Lancet, Dec. 8, 15, 22, 1894.

⁶ Inaug. Dissertation, 1894.

⁷ Klin. Monatsbl. f. Augenh., Sept., 1894.

three weeks, then places it in a solution of chloral hydrate, gradually increasing in strength from 10 to 25 or 50 per cent., for from two to four days, and finally in glycerol. By this method the media retain their transparency.

Methods of Healing after Perforating Wounds.—Duffing¹ and Herrenheisser² have examined microscopically the coats of the eye after perforating wounds and demonstrate three kinds of possible healing:—1. Immediate union of the edges of the wound by small, firm tissue supplied from the sclera. 2. By rough, wide tissue from the uvea or vitreous, frequently followed by contraction. 3. By thin elastic tissue from the sclera. Under the microscope no distinction can be seen between new and old tissue at the line of union, one passing imperceptibly into the other.

Results of Traumatism upon the Iris and Pupil.—Wintersteiner³ reports 6 cases of direct injury to the ball by which either a whole or a part of the iris was torn from its ciliary attachment and was lost, and Hirschberg⁴ 1 case in which a man received an injury that detached a portion of the periphery of the iris. He had 3 D. of hypermetropia in that eye, and hence had monocular diplopia, each aperture operating as a pupil,—a pathologic illustration of Scheiner's well-known test for ametropia.

Pupillary Reflexes.—Nuclear disturbance of the physiologic pupillary reflex is illustrated by a carefully-studied case of Schwarz.⁵ In bright daylight the right pupil was wider and reacted slightly both directly and consensually; the left reacted normally. In the dark the left pupil was wider, contracting very little with convergence, while the right reacted well. The large right pupil acted only upon convergence. The possible cause was a congenital abnormality in development of the nuclei, or perhaps a disturbance of the fibers leading to the right nucleus of the sphincter.

A case of sarcoma, the result of a blow, is reported by Webster⁶ in a patient of ten. The growth sprung from the ciliary body, measured 8 × 12 mm., and consisted of fibrillar basement-substance, bloodvessels, large round cells in vast numbers, and a few spindle cells; there were no glioma cells.

Embryology teaches that the retina does not terminate at the ora serrata, as has been believed, but is continued forward to form the posterior layer of the iris, and is there represented by two layers of pigmented cells. The posterior layer, discovered by H. Müller, is extremely fine and fragile, and in iridocyclitis contains numerous pigmented granulations suspended in the aqueous which are susceptible of colloid degeneration.

Purulent Metastatic Ophthalmia is due to one of three causes, puerperal fever, surgical pyemia, or to blood-poisoning from general diseases. Sympathetic ophthalmia has not been observed in any of these cases. In the puerperal cases the panophthalmitis commenced generally in the first or

¹ Inaug. Dissert., 1894.

² Wien. klin. Woch., Nov. 15, 1894, No. 46.

³ Graefe's Arch. für Oph., Bd. xl., Abth. 2.

⁴ Centralbl. f. Augenh., Dec., 1894.

⁵ Centralbl. f. Augenh., Dec., 1894.

⁶ N. Y. Med. Jour., May 12, 1894.

second week after confinement, and in the fatal cases death occurred about the sixth day. The mortality when only one eye was affected was 66 per cent.; when both were affected all died. The course of the cases due to the second cause was very similar and the mortality somewhat lower, so that the conclusion may be drawn that metastatic purulent ophthalmia, at least when confined to one eye, accompanies much oftener rather lighter cases than are usually found in surgical pyemia. In many cases the retina was found to be primarily affected by the infection early, and in cases in which the choroid seemed to be first affected, it attacked the anterior section, where, according to Sattler, the finest capillaries are found. The most favorable cases are those due to infection from general disease, in which cases the mortality was 55 per cent. When the eye alone was affected by metastasis the mortality was only 21 per cent. The pneumococcus of Fraenkel and Weichselbaum is a frequent cause of such metastasis, as this bacterium is so widely distributed in the human body.

THERAPEUTICS.

The Germ-theory of Disease.—Bearing in mind the action of bacteria and ptomains, it is necessary for us, according to Panas,¹ to reconsider our theories of many diseases and of their treatment. Toxins, whether the product of microbes or engendered by the organism itself, play a most important part in the causation and course of a large number of diseases accompanied by eye-lesions. Arthritis, diabetes, dyspepsia, etc., he attributes to toxins engendered by the organism itself, and in the treatment of these, as well as that of scrofula and syphilis, we must seek to free the system of these poisons and build up its powers of resistance to their inroads. A large proportion of the old theories of sympathy, metastasis, etc., are now explained by the discovery of toxins. Certain forms of retinitis, hyalitis, and other forms of inflammation frequent in dyserasic individuals, ocular affections occurring with the menopause, those observed in young women suffering from vaginal blennorrhagia, leukorrhœa, salpingitis, or metritis,—all these manifestations in the organ of vision of a general morbid state are now well explained by the absorption of toxins. The same is true of diphtheria. It is now known that the infection of the organism is produced, not by the penetration of the microbes of Klebs into the different organs, but by the absorption of the toxins, which poison the blood.

Mercury.—Mercury is employed internally by Panas² not alone as a specific against syphilis, but also as a means of disinfecting the organism; the same is true of many other remedies. In all cases when he suspects tubercle he employs iodoform internally. This is given by the mouth in the form of tablets made up with powdered coffee.

¹ Rec. d'Oph., Nov., 1895.

² Loc. cit.

The biniodid is preferred, dissolved in sterilized oil and given as an intramuscular injection.

In keeping with the advanced views of Panas are the experiences of Chibret and Parisotti. Chibret¹ gives expression to [somewhat extreme] views when he states that for many years he had suspected that potassium iodid had no specific value in syphilis, and nineteen years' practice in ophthalmology has confirmed him in this opinion. He believes that in the mixed treatment it is to the mercury that we owe the good results, and that the iodid is only useful in cases of intolerance, saturation with the mercurials, rheumatism, or "lymphatism." Outside of these cases it is useless and even harmful, because it diminishes the therapeutic value of the mercury. The action of the iodid he believes in general aids in eliminating the mercury.

Parisotti² reports cases of iritis, interstitial keratitis, and paralysis of the ocular muscles that were cured by an injection of a solution of the oil of the mercuric iodid. He believes calomel-injections to be equally efficacious. All of his cases were simultaneously treated by large doses of potassium iodid.

Scopolamin.—Raehlmann³ has called the attention of the profession to this mydriatic alkaloid obtained from the roots of the *Scopolia atropoides*. He employed it in a solution of from $\frac{1}{8}$ to $\frac{1}{10}$ per cent. and claimed certain advantages over atropin and other drugs of that group, especially in that in the above dose it caused no constitutional symptoms. [The present literature and experience regarding scopolamin indicate that it is very closely allied to atropin—if, indeed, it be not the same drug obtained from a new source.] Lobassow,⁴ after a series of experiments on men and rabbits, comes to the following conclusions in regard to the action of scopolamin on the eye:—1. It dilates the pupil more quickly and powerfully than atropin, and paralyzes the accommodation, the effect being less lasting than that of atropin. 2. It causes no complications. 3. In spasm of the accommodation scopolamin acts more powerfully than atropin. 4. It is absorbed more quickly into the anterior chamber than atropin. 5. When applied locally or in subcutaneous injections, scopolamin favors the absorption of other substances into the anterior chamber. 6. It increases the intraocular pressure in eyes predisposed to glaucoma. 7. Its antiphlogistic effect is less than that of atropin. 8. In cases of idiosyncrasy, it is preferable to atropin.

[The statement which has been made that scopolamin does not cause increased tension, and may, therefore, be used in glaucoma, seems to be without foundation and is dangerous and misleading.] This is shown by the induction of true glaucoma in a gouty subject by the instillation of weak solutions, as reported by Waller.⁵ Pooley⁶ gives an interesting account of

¹ Rec. d'Ophthal., Oct., 1894.

² Klin. Monatsbl. f. Augenh., xxxi., No. 2, 1895.

³ Klin. Monatsbl. f. Augenh., Jan., 1895.

⁴ Ann. d'Oculist., April, 1894.

⁵ Rev. Gén. d'Oph., March, 1894.

⁶ The Practitioner, May, 1895.

his experience. He used a $\frac{1}{5}$ per cent. solution at intervals of fifteen minutes for determining anomalies of refraction. Mydriasis was produced in from ten to fifteen minutes and complete cycloplegia in from forty-five to sixty minutes, *i. e.*, after three or four instillations. The duration of the mydriasis and cycloplegia was from twenty-four to forty-eight hours. In several cases a diminution in the visual acuteness was noticed after the drug had fully paralyzed the accommodation and the error of refraction had been corrected. He reports three cases of constitutional symptoms, arising from six drops of the $\frac{1}{5}$ per cent. solution, irregular and rapid heart action, staggering gait, sensation of pins under the feet, dryness of the throat, and twitching of the muscles of the face. There was no erythema. [There is, however, a difference of opinion on this point.] Bokenham¹ says scopolamin is free from the unpleasant effects of some of the other cycloplegics. Smith² agrees with Pooley that its absorption is followed by toxic symptoms. The advantage claimed for it, that its effects pass off sooner, is more than counterbalanced by the temporary amblyopia (which of necessity prevents its use to determine errors of refraction) and the dangers of toxemia.

Formol.—Oliver³ has studied the action of formol in purulent ophthalmia, in which it succeeded in 18 out of 20 cases. In 3 cases of conjunctivitis and in 4 of dacryocystitis recovery followed its use after a few days. It does not produce erythema, conjunctival or palpebral ulcerations, or corneal lesions, and is, in short, an excellent ocular antiseptic. He used it as a collyrium in the strength of 1 : 100, and as a lotion 1 : 1000 or 1 : 2000. Guaita (quoted by Oliver) also found it extremely efficient in trachoma, but he preferred to use it in the strength of 1 : 2000, stating that stronger solutions were irritating and extremely painful.

Fromaget⁴ gives a qualified approval of formol in cases of purulent ophthalmia. He employs it as a collyrium in the proportion of 1 : 200 and as a wash, 1 : 2000. After carefully bathing the palpebral and bulbar conjunctiva with a 1 : 2000 solution he instills several drops of the stronger collyrium. In 13 cases treated by this method exclusively the average period of treatment was about nine days, and all were followed by recovery. [It should be observed, however, that these were cases of corneal involvement, and in the hands of other observers more advanced cases have not yielded such results.] He records two failures in blennorrhœic ophthalmia in the adult. He still regards silver nitrate as the leading antiseptic in purulent ophthalmia, but considers that it should be applied by the physician, while conjunctival irrigation with a 1 : 2000 solution of formol is employed by the attendant in the interval between the applications of the nitrate.

¹ Brit. Med. Jour., Sept. 15, 1894.

³ Ann. d'Oculist., Jan., 1895.

² N. Y. Med. Jour., July 21, 1894.

⁴ Ann. d'Oculist., Feb., 1895.

Formol is strongly recommended as a hardening agent for pathologic specimens by Marshall.¹ If an eye be immersed in a 10 per cent. solution for twenty-four hours it can be cut into microscopic sections without freezing. He is strengthened in his opinion by Juler, Robertson, and others.

Trikresol.—E. A. de Schweinitz² recommends trikresol as an antiseptic for collyria and as fatal to the pyogenes aureus in the strength of 1 : 1000. In collyria that have been prepared for three months he finds no growth or fungus, and no growth is yielded by cultures.

Tropacocain.—Tropacocain is said by Bokenham³ to be a useful local anesthetic in 3 per cent. solution, especially in the removal of foreign bodies from the cornea. Its action is uncomplicated by dilatation of the pupil or paralysis of accommodation.

Antipyonin.—Rolland⁴ says that after three years' treatment of keratitis and conjunctivitis exclusively with antipyonin, during which time he saw 1000 patients, he believes that no other drug could have produced so many cures.

Chlorin Water.—Lawford⁵ considers chlorin water, when used freely externally, and injected into the anterior chamber, one of the most powerful antiseptics in suppurative disease of the conjunctiva, cornea, and iris.

Eserin has taken a prominent place in the past few years in the treatment of eye-diseases other than glaucoma. Jackson⁶ summarizes the diseases in which he considers its application in the strength of from $\frac{1}{8}$ to $\frac{1}{4}$ grain solutions useful :—in corneal ulcer ; interstitial keratitis, without iritis ; mydriasis and cycloplegia ; measuring refraction with irregular astigmatism ; to prevent prolapse of the iris during simple extraction ; in certain degenerative processes such as retinitis pigmentosa and chronic choroidal atrophy. [Its usefulness in measuring refraction and in chronic fundus-affections may well be doubted.]

Three New Antiseptics, mercuric cyanid, 1 : 1000 ; cresylic acid (a preparation of coal tar), 1 : 100 ; and lysol, 1 : 1000, have been tested comparatively by Neupauer⁷ with the following result : The last two are unavailable for ophthalmic practice, while the first is recommended, killing cholera bacilli in one minute, anthrax bacilli in one minute, and staphylococcus pyogenes aureus in five minutes.

Aristol as an ointment (5 per cent.) in long-existing corneal ulcers, in ulcerative blepharitis, and chronic hordeola has been found by Hense⁸ to be highly useful, and on account of its nonirritating properties it might be preferred to the ointment of the yellow oxid of mercury. The following pre-

¹ Oph. Rev., Jan., 1895.

³ Ref. Therap. Gaz., Oct., 1894.

⁶ Jour. Oph. Soc. Unit. King., July 6, 1894.

⁷ Ungar. Beiträge z. Augenh., Bd. 1, 1895.

² Therap. Gaz., July, 1894.

⁴ Méd. Mod., May 12, 1894.

⁶ Phila. Polyclinic, Aug. 18, 1894.

⁸ Therap. Monats., Feb., 1895.

scription has been mentioned by Von Oehlen¹ in the treatment of chronic conjunctivitis accompanying eczema :—

R. Ichthyol,	gr. iij-viij.
Powdered starch,	
Zinc oxid,	āā 5iiss.
Vaselin,	5viss.
Mix thoroughly. For external use.	

Collyria.—Bettman² calls attention to an article, entitled “Eye-Drops Abolished,” by DeWecker³ containing severe strictures and dogmatic declarations against the use of fluid medicaments in the conjunctival sac. He condemns them in toto when the corneal epithelium is lost, and says they cannot be aseptic because the lotion passes over the lashes, touches the skin, etc., and must become infected. [While the indiscriminate use of lotions is bad, we cannot agree with DeWecker that solutions in the hands of intelligent patients can not be kept fairly aseptic.]

The Therapeutic Value of Ice in the early stages of inflammation, by contracting the small vessels and diminishing the blood-supply, and later by preventing the formation of pus through impairing the functional activity of microorganisms should not be forgotten in acute conjunctivitis, traumatic or infectious.⁴

For Ophthalmoscopic Examination, Groenevow⁵ considers the following solution better than any that has been proposed :—

Ephredin,	1.0
Homatropin hydrochlorate,	0.01
Distilled water,	10.0

After the instillation of 2 or 3 drops in the conjunctival sac the pupil begins to dilate in eight and one-half minutes, reaches its maximum (5–6 mm.) in a half hour, and disappears in from four to six hours. It is not a cycloplegic and is not irritating.

Subconjunctival Injections.—The treatment of inflammatory diseases of the eye by means of subconjunctival injections has been the subject of numerous papers. [We are inclined to believe from our own experience that the good results of this method have been greatly over-estimated, and that it will henceforth be rarely employed.]

De Silva⁶ traces the history and describes the advantages and disadvantages of this method of administering mercuric chlorid. He supports his belief in it by a number of observations. The following is a list of the diseases in which he recommends its use :—1. Affections of the cornea, interstitial keratitis, and ulceration with infiltration. 2. Ocular affections consecutive to the operation for cataract. 3. Episcleritis with corneal complications. 4. Iritis. 5. Syphilitis iridochoroiditis. 6. Choroiditis with opacities in

¹ N. A. Prac., Oct., 1894.

² Am. Prac., Aug., 1894.

³ Ann. d'Oculist., June, 1894.

⁴ Gillivray, Oph. Rev., Sept., 1894.

⁵ Deutsch. med. Woch., No. 10, 1895.

⁶ Ann. d'Oculist., June, 1894.

the vitreous humor. 7. Choroidoretinitis. 8. Hyalitis. 9. Absolute glaucoma. 10. Neuroretinitis. In all of these affections, by employing the injections after the manner described by Darier, he claims to have obtained excellent results.

Zossenheim,¹ in a valuable clinical contribution, claims good results in parenchymatous keratitis, plastic iritis, and episcleritis, while Deutschmann gives strong evidence in its favor in infected and inflamed eyes after cataract extraction. Baker² reports more successes in the treatment of deep-seated diseases than most others who have used this method. Alexander, "Neue Erfahrungen," 1894, strongly recommends it. De Schweinitz³ describes three cases of gonorrheal ophthalmia that were speedily cured. [The statements of enthusiasts in this, as in other new methods, must be received with caution. They are likely to be misled and claim for the method or remedy better results than greater experience will warrant. The observation by conscientious clinicians of a large number of cases in which other methods have failed, is necessary to establish the utility and value of any novelty in therapeutics.] Others, as Briggs⁴ and Siklossy,⁵ even make the extraordinary assertion that "In the majority of cases of pannus, recovery was rapid after 3 or 4 injections of 1:1000 solutions at intervals of two days." Some, however, believe that the curative powers of this procedure are greatly over-estimated. Bull,⁶ after its employment in 48 cases of various diseases, says that the pain is often severe, the reaction violent, and the only cases in which it shortened the course of the disease were 3 of non-syphilitic scleritis and acute iridochoroiditis. On the whole, he is adverse to it. Muttermilch⁷ claims that many published accounts of cures were not owing to the mercuric solution, and that the results of such injections in cases tried by him were nil. Schutte,⁸ who credits Raymond of Turin as being the originator of the treatment, thinks its efficacy is due to the stimulation of the lymph-flow and not to antisepsis. [We are inclined to accept this explanation of its action, and believe that its curative properties do not reside altogether in the mercury, but that the fluid injected stimulates the absorbents to greater activity, and that the same good results may be equally well obtained when other salts are used.] This view is supported by Matrangas,⁹ who calls attention to the fact that while the injections succeed in episcleritis, Van Moll has obtained the same result by subconjunctival injections of sodium salicylate, and Marti¹⁰ states that in the clinic of Professor Scheiss for a year

¹ Beiträge z. Augenh., Hft. xv., Sept. 25, 1894.

² Ann. of Ophthal. and Otol., Oct., 1894.

⁴ Jour. Am. Med. Assoc., Sept. 15, 1894.

⁶ N. Y. Med. Jour., Jan. 19, 1895.

⁸ Klin. Monatsbl. f. Augenh., Feb., 1895.

³ Phila. Polyclinic, Oct. 6, 1894.

⁵ Ann. d'Oculist., Jan., 1895.

⁷ Ann. d'Oculist., Oct., 1894.

⁹ Ann. d'Oph., Feb., 1895.

¹⁰ Ann. d'Oculist., Jan., 1895, and "Subconjunctival Kochsalzinjectionen und ihre therapeutische Wirkung bei Destructiven Hornhaut-processen." Dr. Arnold Marti and Carl Sallmann, Basel and Leipzig, 1895.

injections of sterilized solutions of common salt, ordinarily about 2 per cent., have completely replaced those of mercury. Marti reports 25 cases in which, when compared with other methods of treatment, the advantage is on the side of the salt-solution. It is his belief that "salt, being hygroscopic, so to speak, pumps the liquids from the cells and fibers of the neighboring tissues," and thus aids in the separation of the diseased portions and causes the harmful substances to be carried away in the accelerated lymph-current.

OPERATIONS.

Trichiasis and Distichiasis.—Feuer,¹ for the cure of trichiasis, transplants a portion of the skin into the intermarginal space from the adjoining lid, and for distichiasis he divides the intermarginal space, lifts the ciliary edge, and destroys the bulbs by electro-cautery. This is a simpler operation than that proposed by Germaix,² which consists in dissection of the anterior leaf of the lid on the ciliary border according to Arlt, cauterization of the bulbs of the distorted lashes, extraction of a semilunar piece of skin above the cartilage, and suturing the upper leaf to the lower concave border of the cut made by removal of the skin. [This operation is more suitable for entropion than for trichiasis.] Watson³ excises the ciliary border, and transplants in the space thus laid bare a strip of skin taken from above it on the lid. [A method almost identical with that of Feuer, whose article describing his operation appeared at a later date.]

Transplantation of Large Skin-grafts for the cure of deformities of the lid are reported by Hansell,⁴ for syphilitic erosions by Silex,⁵ for symblepharon by Gasparini,⁶ and for malignancy of the eyelids by Tyree,⁷ and have proved successful operations. After repeated recurrences of epithelioma of the orbit in spite of excision, the actual cautery, and zinc-chlorid paste, Tiffany⁸ undertook to cover the denuded surface with skin-grafts, which immediately attached themselves and grew vigorously, smothering out the malignant growth. There had been no recurrence at the end of ten years. He has since repeatedly resorted to this method with uniform success. Ogston⁹ made a new socket for an artificial eye in a case of greatly contracted orbit by dissecting from the temple a flap of skin 2 or 3 in. in width and divided horizontally. Each half was then turned into the enlarged cavity and sutured.

Ptoſis.—In ptoſis, from total paralysis of the levator palpebræ muscle, Peschel¹⁰ modifies the thread-operation by connecting the upper border of the

¹ Ungar. Beit. z. Augenheil., Bd. i., 1895.

² Oph. Soc. Unit. King., July 6, 1894.

³ Berlin. klin. Woch., No. 51, 1895.

⁴ Kan. City Med. Index, No. 179, 1894.

⁵ Brit. Med. Jour., Dec. 1, 1894.

⁶ Rec. d'Oph., July, 1894.

⁷ Med. News., May 9, 1894.

⁸ Ann. di Ottol., No. 3, 4, 1895.

⁹ Int. Jour. Surg., May, 1894.

¹⁰ Centralbl. f. prak. Augenh., Oct., 1894.

tarsal cartilage to the lower border of the occipitofrontalis by 3 sutures instead of 1.

Pterygium.—[The operation for pterygium that has succeeded best in our hands is forcible tearing of the apex from the cornea by means of a strabismus hook, and transplanting the apex above or below the cornea under the conjunctiva. Conjunctival sutures are seldom necessary.] Bettman¹ detaches the growth from the underlying tissue from apex to base, and by means of a double-needled suture passed through its apex, turns the latter under the pterygium as far as the base and ties the threads. Schulek² cuts the apex from the cornea and part way back on the sclera, and draws the conjunctiva together with sutures far enough back to prevent tearing out. Hobbs³ uses the galvanocautery; the fine-pointed cautery-blade, heated with a battery that can be perfectly gauged and always relied upon, is applied horizontally to the narrowest portion of the growth; the touch is made the moment white heat is reached, and should be almost instantaneous and reapplied as quickly if the tissues are not at first completely severed. It is followed by no bleeding or ecchymosis, the wound heals rapidly, and there is little pain.

Corneal Grafting.—Fuch's experience in cornea-grafting in sections as a substitute for von Hippel's method, in parenchymatous keratitis and corneal staphyloma, was not eminently successful, but he considers the operation worthy of trial in cases that are without help and doomed to blindness.⁴

Staphyloma.—A procedure that can check staphyloma and retain useful vision will be warmly welcomed by ophthalmic surgeons. The 5 cases reported by Schaeffel were operated on by Professor Schiess as follows:—A Graefe knife was entered near the temporal border of the cornea, and, with the back of the blade toward the iris, the counterpuncture was made on the nasal side, varying the size of the cut in accordance with the degree of conicity. If the cone were very pronounced, he made a large cut, but did not complete it in the center, leaving a small bridge, while in less prominent cones he made a smaller incision, but completely through the apex of the cornea. The following advantages are claimed for this operation:—Employed with prudence it is without danger; if in some cases it slightly diminishes vision, it improves it to a considerable degree in others; it checks the progress of the ectasia.

Foreign Bodies.—For the removal of foreign bodies from the cornea that are not too deeply and firmly implanted, Gould⁵ advises the use of a wisp of twisted absorbent cotton, folded upon itself (or rolled about the point of a little wooden applicator) and brushed across the cornea or pressed against it. No injury is done, cocaine and instruments are not needed, and the result is very gratifying. Workmen in factories should be taught the method, and

¹ Internal Med. Mag., July, 1894.

² Ungar. Beit. z. Augenh., Bd. i., 1895.

³ Atlanta Med. and Surg. Jour., July, 1894. ⁴ Wien. klin. Woch., Nov., 1894.

⁵ Med. News, Dec. 15, 1894.

the use of corneal spuds, pins, knives, awls, etc., should be discouraged. Jackson¹ uses the galvano-cautery for the removal of powder grains from the cornea and skin.

Cataract.—Landau² advises the aspiration of traumatic, as well as congenital cataract. Taylor³ operates in secondary cataract according to the method proposed by Noyes, modified by the use of a more blunt hook. A Graefe knife is entered at the limbus and the capsule punctured before the counterpuncture is made, the blunt hook is introduced into the cut, the opaque membrane caught, drawn out, and cut off.

Diseases of the Lens.—Schulek⁴ in a pamphlet that has nothing in particular to recommend it and containing a number of articles by different authors, has suggested operations that are slight modifications of iridotomy and superior to it in very few cases.

In senile cataract, Mooren⁵ operates as follows :—Under thorough antiseptics of conjunctiva, lids, and lacrymal canals, and anesthesia by a 2 per cent. solution of cocain, he enters the Graefe knife below (or above) the horizontal diameter of the cornea in the corneoscleral border, perpendicularly, until the membrane is pierced, and thrusts through the anterior chamber to make counterpuncture exactly opposite. While slowly cutting through, the knife is slightly inclined forward, in order to bring the summit of the cut below (above) the middle of the pupil. He reintroduces the same knife and with it makes the capsulotomy. The lens is then forced out by pressure and counterpressure. He prefers to make the cut below, in general, on account of the greater safety, while the knife is in the eye. He recommends artificial ripening by discission; the extraction of the lens in high myopia whether clear or opaque; iridotomy by a Graefe knife instead of by DeWecker's scissors; and in all operations the use of the fewest possible instruments. H. Merz⁶ holds that entanglement of the capsule in the wound after cataract by contraction will sometimes produce iridochoroiditis and glaucoma in the eye operated on, and then the second eye, sympathizing, may follow the same course.

Tenotomy and Advancement.—[In the surgical treatment of heterophoria and heterotropia, advancement, or shortening of the relaxed or weakened muscle or tendon, is very properly supplanting tenotomy.] Williams⁷ operates as follows :—A horizontal incision is made through the conjunctiva over the tendon and muscle, from close to the cornea, as far as the canthus; the muscle is uncovered, exposed, and elevated on a strabismus hook. A needle is entered below (above) the line of incision, close to the cornea, is passed under the conjunctiva to the lower (upper) border of the muscle, through the muscle vertically and out at the upper (lower) edge, and forward

¹ Oph. Rev., April, 1895.

² Centralb. f. Prak. Augenh., Feb., 1895.

³ Lancet, Oct. 18, 1894.

⁴ Ungar. Beit. z. Augenh., Bd. i., 1895.

⁵ "Die Operative Behandlung, etc.," 1894. ⁶ Klin. Monatsbl. f. Augenh., Feb., 1895.

⁷ Oph. Rev., Dec., 1894.

to a point in the conjunctiva above (below) corresponding to the entrance. The tendon is then divided, the eye rotated toward the muscles, the thread drawn tight and knotted.

Another new and promising operation is suggested by Prentice,¹ in which the muscle is dissected free from capsule and conjunctiva, a suture passed through it transversely to its length; each needle then perforates the margin near the scleral insertion, and is continued under the conjunctiva 4 mm. in advance of the insertion and tied. Ligature-plates are inserted under the knot, stretching the thread apart according to the length of the plate, and thus advancing the tendon; if not enough advancement is made, a larger plate is substituted, and if too much, a shorter. [An excellent plan.]

Enucleation and Evisceration.—The indications for enucleation of the eyeball, according to Gross,² are 4 in number: in malignant disease, to prevent sympathetic ophthalmia, to relieve pain, and for cosmetic reasons. He advises against enucleation during florid panophthalmitis or in exudative choroiditis in sympathetic ophthalmia. [Every conservative operator will hesitate to enucleate in active inflammatory processes from the fear of inducing an extension to the meninges.] Evisceration of the ball and the substitution of a hollow glass or a silver vitreous (Mules' operation), proposed several years ago, is gaining a foothold. Fox³ and Ring⁴ report successful cases. According to the latter [who reports but a single case, and is therefore not justified in drawing conclusions], the advantages of evisceration of the eyeball are the following: it is equal to enucleation as preventive of sympathetic inflammation; is safer as regards purulent meningitis; it can be performed in panophthalmitis; a better stump is always secured. The disadvantages are pain, swelling, and edema of the surrounding tissues. The reaction will always be greater than after enucleation.

[In all cases of threatening sympathetic inflammation the safe operation is enucleation. Opticociliary neurotomy and neurectomy have largely fallen into disuse since it has been shown that the cut ends of the nerve reunite and the operation does not protect.] Wagenman⁵ proposes to cauterize the distal cut end, in the belief that sympathetic inflammation is of microbic origin, and that the germs are transmitted along the optic nerve; he proposes thus to cut off the passage. The cut end soon becomes covered with cicatricial fibrous tissue. The danger of thus treating the end of the nerve is not great if it is evenly burnt on a level with the sclera. He reports 2 cases of success. From the result of experiments on animals, he can state positively that there can be no question of a union between the 2 ends of the nerve. [In the 2 cases operated on, too short time has elapsed to say what the outcome will be.]

¹ Ann. Oph. and Otol., April, 1895.

² Ungar. Beit. z. Augenh., Bd. i., 1895.

³ Codex Med., Nov., 1894.

⁴ Univer. Med. Mag., April, 1895.

⁵ Graefes Arch. f. Oph., Bd. xli., Abth. 1.

NEW INSTRUMENTS.

Prince,¹ in order to determine accurately the axis of astigmatism in retinoscopy, uses a thin circular metal plate with a central aperture and a handle.

A refractometer for skiascopy invented by Lambert² consists of two superimposed discs containing plus and minus lenses and a slide containing cylinders which can be placed at any desired axis. Another, devised by Würdemann,³ is represented in the accompanying diagram.



Fig. 6.—Würdemann's refractometer for skiascopy (Jour. Am. Med. Asso., Chicago, Sept. 1, 1894).



Fig. 7.—Weiland.—A simple and efficient test for binocular reading (Med. News, Sept. 29, 1894).

Wilson⁴ has devised a portable perimeter for measuring the field of vision at the bedside.

Aiken⁵ substitutes for the Maddox rod a series of glass rods or cylinders in juxtaposition, and a large square opening instead of a stenopaic slit, to

¹ Oph. Rev., July, 1894.

³ Jour. Am. Med. Assoc., Sept. 1, 1894.

² Trans. Am. Oph. Soc., 1894.

⁴ Trans. Am. Oph. Soc., 1894.

⁵ Med. Rec., Oct. 20, 1894.

obviate the necessity for finding the exact pupillary region, as must be done by the single rod.

To measure the interpupillary distance Perry¹ has devised an instrument that consists of 2 mirrors, 1 being movable, adjusted on a graduated rod, so that the images of the patient's cornea are reflected into the observer's eyes. [According to the meager description given in the article, we infer that the interpupillary distance as recorded is modified by the observer's position.]

Parinaud² and Javal³ have suggested different devices, such as mathematic figures, to aid in fusion of binocular images.

Weiland⁴ has suggested an efficient test to determine binocular fixation in reading. A vertical bar is interposed between the eyes and the reading test. If both eyes are used, no interruption in the words is noticed. If only one eye, a part of the test will be hidden. If the right eye is not used, the lines on the left of the test, if the left eye, those on the right, will be broken in their continuity.

The objections to the MacKeown-Hirschberg method of extraction of foreign bodies by magnet, as stated by Schirmer,⁵ are the danger of infection and the loss of vitreous, frequently much larger in amount than Hirschberg allows. Gallemearts⁶ has devised a useful instrument to diagnose both the presence and the position of a foreign body in the interior of the eye.

Haab⁷ recommends a very large electromagnet consisting of 2 copper coils wound around a double-pointed cylinder of soft iron. It is claimed that this form can attract larger pieces of steel and is more useful than the smaller form.

Asmus⁸ claims to be able to diagnose with the help of the magnet both the presence and situation of a foreign body in the interior of a ball.

The Paquelin thermocautery is preferred by Sapodi⁹ in the treatment of blennorrhea of the lacrymal sac or gland and in cauterization of corneal wounds and ulcers.

The Risley rotary prism for exercising the ocular muscles has been modified by Brown¹⁰ and by Prince.¹¹

Bourgoutis suggests that cataract-patients shall constantly wear glasses for near, and to the upper border shall be attached a smaller loop containing a minus glass swung on a hinge to be let down when clear distant vision is necessary.

Galezowski¹² proposes to mount a reading-glass by a hinge on the temporal side of the spectacle frame containing the distant correction. When

¹ Oph. Rec., July, 1894.

² Ibid.

³ Deutsch. med. Woch., July 19, 1894.

⁴ Beit. z. Augenh., Jan., 1894.

⁵ Ungar. Beit. z. Augenh., Bd. 1, 1895.

⁶ Ophth. Rec., July, 1894.

⁷ Arch. d'Oph., July, 1894.

⁸ Med. News, Sept. 29, 1894.

⁹ Arch. d'Oph., July, 1894.

¹⁰ Arch. f. Augenh., Bd. xxxix., Heft 2.

¹¹ Jour. Am. Med. Assoc., Sept. 15, 1894.

¹² Rec. d'Oph., Sept., 1894.

wanted for near-work it is easily rotated into its desired position. [Neither of these devices is to be compared with the cement-bifocal lenses introduced by Gould in 1888.]

Hirschberg¹ uses a porcelain tray 155 mm. long, 130 mm. wide, outer height 26, inner 16, with two indented rails on which to rest the instruments after boiling or immersing in sterilized fluid; it contains $\frac{1}{4}$ liter only.

Issekutz² recommends a shield of wax as a protection to prevent infection of the sound eye in contagious ophthalmia. The edges are made adherent by means of sticking-plaster and so adjusted as to permit movement of the eye.

For cases of ectropion, Cleve³ has devised a small shelf or ridge that can be readily adjusted to the edge of glasses or spectacles. By its backward and horizontal projection a paralyzed lower lid may be elevated and held in its proper position.

May⁴ has modified the cilia-forceps by making one extremity concave, the

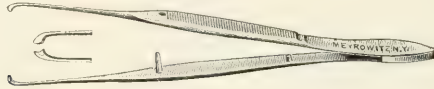


Fig. 8.—May.—An improved cilia-forceps (Med. Record, Sept. 15, 1894).

other convex, and fitting one another closely. The pressure upon the handle firmly fastens the hair without cutting it off.

For raising the upper eyelid Bass⁵ uses a corrugated metal rod which easily raises the lid from the ball by a gentle rolling movement when laid against the skin parallel with the ciliary border.



Fig. 9.—Method of everting the eyelid.

Antonelli⁶ has devised a modification of Javal's ophthalmometer by which it may be adapted to measure the amplitude of excursions of the eye in cases of pulsating exophthalmos and other researches of ophthalmostatometry.

Davis⁷ proposes new mires for the ophthalmometer, each of which shall be movable in order that their images maintain equal distances from the center of the cornea, that mistakes in measurement may be avoided when the meridian measured presents more than one radius of curvature.

¹ Centralbl. f. Prakt. Augenb., March, 1895.

² Ungar. Beit. z. Augenb., Bd. 1, 1895.

³ Monatsbl. f. Augenb., Jan., 1895.

⁴ Med. Rec., Sept. 15, 1894.

⁵ Brit. Med. Jour., July 14, 1894.

⁶ Arch. d'Oph., Sept., 1894.

⁷ N. Y. Med. Jour., Feb. 16, 1895.

OTOLOGY.

BY CHARLES H. BURNETT, M.D.,

OF PHILADELPHIA.

General Considerations.—[This chapter has been prepared for the general physician, to guide him in the diagnosis and treatment of aural diseases as far as it is possible for him to attain these ends alone, and also to inform him how these diseases should be treated when they have assumed forms with which he cannot cope. The consideration of anatomy and physiology, as well as the special means of physical diagnosis, has been omitted, and the chapter has been based on the articles of greatest practical value in otology that have appeared from July, 1894, to June, 1895, inclusive. Articles containing nothing new and those embodying useless or dangerous advice have not been mentioned, excepting in a few instances in order to condemn the error they contain.]

As the matter now stands, the ear-patient of the general physician often suffers either from neglect or from improper treatment, or a specialist must be called in. This aid is often not at command, and the patient sometimes loses hearing, happiness, and even life. In the last-named event the ear is often not recognized as the starting-point of the fatal malady, usually an intracranial affection. Had the private patient in such a condition been a hospital patient, under the observation of a competent aurist, the true nature of his malady would have been recognized early, proper treatment instituted, and in many instances life saved.]

DISEASES OF THE EXTERNAL EAR.

Eczema of the External Auditory Canal.—We have observed only one paper on this subject this year. Dr. Hermet¹ has presented the causes and symptoms very graphically. [The treatment of acute eczema of the auditory canal with strong solutions of silver nitrate, as recommended by him, we have found valueless. In fact, nothing equals black-wash ad libitum, by instillation, in the burning, painful stage of acute eczema in the ear, the resultant grayish scales being allowed to remain until they desiccate and fall off.]

Those affected with bulbar tabes² may present cutaneous ulcerations of the face, nose, and ears, the symmetrical distribution of which demonstrates its trophic origin.

¹ Jour. de Méd. de Paris, Jan. 27, 1895.

² "Tabes bulbaire: Ulcerations trophiques du Nez et des Oreilles," Presse méd., Oct. 27, 1894, Dr. C. Giraudeau.

Hematoma.—Bilateral hematoma of the lobule may occur as the result of traction (violence) on these parts.¹ In Randall's case the sacs were opened, lightly curretted, vigorously rubbed with iodin glycerite, packed with iodoform-gauze, and covered with a pressure-bandage. The right lobule healed in four days; the left had not entirely healed when the patient withdrew from observation.

Piercing the lobule for ear-rings often leads to secondary infections. Thus, Fournier² reports that various forms of contagion result from piercing the lobule of the auricle with the dirty instruments employed by jewellers for this purpose. Lupus, tubercle, and syphilis are among the maladies thus communicated.

Perichondritis.—A. Courtade³ of Paris claims that most cases of so-called primary perichondritis of the auricle are in reality instances of cutitis and lymphangitis of the outer ear. This leads to altered nutrition in the perichondrium and the cartilage. Perichondritis of the auricle has been cured by repeated aspirations. This method is recommended as worth a trial in othematoma.⁴ Sexton successfully employed this means of treatment in othematoma some years ago.⁵

Obliteration of the External Auditory Canal.—Straight⁶ found an apparently completely developed ear with the exception of the external auditory canal, which was obliterated by bony closure. Deafness existed on this side, and an operation for its relief was not thought practicable.

Congenital Atresia.—Bezold⁷ reports a case of congenital atresia of the auditory canals with rudimentary auricles, in which the hearing for conversation was 12 cm. on both sides. In another case with similar defects the hearing for conversation was 30 cm. in the right and 18 cm. in the left ear. [In such cases an operation having in view the formation of a meatus would be justifiable.]

Neoplastic Membranes.—An anonymous writer⁸ reports the successful destruction of neoplastic membranes extending across the external auditory canal by means of chromic acid, applied in very small quantities on a cotton-tipped probe to the central parts of the membrane. After the inflammatory result of one application subsides another application may be made.

Carcinoma.—A case of primary epithelial carcinoma of the cartilaginous auditory canal and of the auricle, in a child seven years old, was successfully operated upon and reported by Decker.⁹

¹ Archives of Otol., July, 1894.

² Jour. des Mal. cutan. et syphil., vi., 1894, p. 321; Jour. de Méd. de Paris, July 15, 1894.

³ Ann. des Mal. de l'Oreille, Aug., 1894.

⁴ Haug: Münch. med. Wochenschr., Aug. 28 and Sept. 4, 1894.

⁵ Diseases of the Ear, p. 149.

⁶ Uni. Med. Mag., Aug., 1894.

⁷ Ann. des Mal. de l'Oreille, Oct., 1894.

⁸ Virginia Med. Monthly, Jan., 1895.

⁹ Ann. des Mal. de l'Oreille, Oct., 1894.

BIBLIOGRAPHIC REFERENCES.—Rohrer of Zurich: "Anomalies of Structure in the Auricle," XI. Internat. Med. Congress, 1894; Archiv f. Ohrenheilk., April, 1895.

Stenosis of the Auditory Canal.—[We cannot admit the necessity¹ of surgical intervention in simple stenosis of the auditory canal. Total occlusion may require an operation if it leads to retention of pus or to deafness. Stenosis alone is not incompatible with ample drainage and good hearing. An operation for its removal may lead to greater stenosis or total occlusion.]

Exostosis of the External Auditory Canal.—Delie² reports a case of exostosis on the upper wall of the external auditory canal in a child, the result of picking the ear with a pin. There were neuralgic pains. The exostosis encroached greatly on the caliber of the canal. Osteoma, pedicellate in form, is sometimes found in the auditory canal.³ [We have removed such by a simple blow with a chisel at the point of attachment, without resorting to the mastoid incision and drawing the auricle and cartilaginous meatus forward, as recommended by some authors.]

The Ear of the New-born Child.—MacCuen Smith⁴ exaggerates the probability that a physiologic condition of the new-born child's ear will pass into a pathologic state. If the ear of a new-born child is let alone, not swabbed or washed in the meatus, no inflammation will occur in it from retained natural secretions. The new-born child is often the victim of too much washing and swabbing of the meatus on the part of over-sensitive mothers and over-sedulous nurses. It is not uncommon to find infants a few weeks old suffering from a discharge from both ears set up in this way. But the true cause of the disease is generally denied by the nurses, sometimes admitted by the mothers. The bad results of trying to remove cerumen from children's ears, from which superfluous wax will fall if let alone, are fully appreciated by Tomka.⁵ The evils of ignorant and unskilful manipulation of the external auditory canal and membrana are shown in a case applying for relief from ear-pain at Prof. Seiss's clinic in the Philadelphia Polyclinic. A perfectly well ear had been roughly probed for reasons unknown, with the result of wounding the fundus of the canal and setting up a profound dermatitis at this point.⁶

Injury by Blows, Coughing, etc.—Attention is again called to the fact that the membrana tympani is often injured in cases of fracture of the skull involving the petrous portion of the temporal bone, by blows on the chin, and by a "box on the ear." Such accidents may or may not be accompanied by hemorrhage from the auditory meatus. Of course it follows, from the nature of some of the injuries named, that hemorrhage from the meatus auditorius is not necessarily a grave symptom.⁷

Gradenigo: "Spontaneous Symmetrical Gangrene of the Auricles (trophoneurotic)," *Archiv für Ohrenh.*, May, 1895.

Kuhn: "A Case of Atesia Auris Acquisita," *Deutsch. med. Wochenschr.*, July 5, 1894; *Archiv f. Ohrenh.*, Bd. 39, May, 1895.

¹ Corradi: *Ann. des Mal. de l'Oreille*, April, 1895.

² *Ann. des Mal. de l'Oreille*, Oct., 1894.

³ Jack: *Am. Otol. Soc.*, 1894.

⁴ *N. Y. Med. Jour.*, July 21, 1894.

⁵ *Internat. klin. Rundschau*, Oct. 14, 1894.

⁶ "A Case of Traumatic Myringitis," W. Henry Fritts, M. D., *Polyclinic*, Jan. 19, 1895.

⁷ J. L. Thomas: *Brit. Med. Jour.*, Nov. 3, 1894.

The bad results of amateur medical treatment of the ear are further shown in Lederman's account of diffuse external otitis from the careless use of phenol, applied by the patient to her ear by the advice of a friend. After a long and painful experience the patient recovered.¹

Similar bad results of infectious treatment in ears already diseased (purulent otitis) are shown in seven cases² of erysipelas in and about the auricle, two of which proved fatal with symptoms of pyemia and intracranial lesions.

"Periotic, subcutaneous phlegmonous edemata" are also usually the result of irritant and infectious applications to the external ear, as shown by Gelle.³ [This accords entirely with our observation; but in our opinion these edemata are forms of erysipelas induced by improper treatment of an otitis.] Coughing may rupture both membranes, as in a case observed by Welsford.⁴ The membrana and the auditory canal may be fractured by a fall upon the lower jaw, as shown by Haug.⁵

The long well-known fact that the membrana may be ruptured in those hanged is reported anew by Lannois⁶ of Lyon.

Hemorrhagic External Otitis.—This form of ear-disease occurs at times in those whose ears are previously affected by chronic catarrh of the nasopharynx and the middle ears, upon exposure to cold after having been in a warm or overheated room.⁷ Courtade⁸ of Paris objects to the name hemorrhagic otitis as applied to this disease, because it lacks the characteristics of an inflammation. It occurs sometimes as a secondary disease in acute otitis, but often idiopathically. Courtade calls it hemorrhagic phlyctenula of the auditory canal and membrane. Sometimes the hemorrhage is said to be considerable after rupture of the bulla. It is regarded by Courtade as probably of nervous origin in some instances, like zona. Otorrhagia from both ears may occur as early as the seventh day in typhoid fever, as reported by Molinié.⁹ In his case there were hemorrhagic tendencies elsewhere.

Congenital perforation of the membrana tympani is described by Gruber¹⁰ of Vienna. Bochdalek is quoted by him as having reported a case in which such perforation was found in each membrana of a man.¹¹ These are regarded as compensatory openings for the loss of the Eustachian tubes. [When the latter tube is closed, it is well known among aurists that a generous opening in the membrana improves the hearing if the auditory nerve is normal.]

Furuncle in the External Ear.—Not much has been written upon

¹ N. Y. Med. Jour., May 18, 1895.

² Hessler: Münch. med. Wochenschr., Jan. 15, 1895.

³ Ann. des Mal. de l'Oreille, June, 1895.

⁴ Brit. Med. Jour., July, 1894.

⁵ Münch. med. Wochenschr., Sept. 4, 1894.

⁶ Ann. des Mal. de l'Oreille, June, 1895.

⁷ See the case reported by Dunn, Archives of Otolaryngology, vol. xxiii., No. 3, July, 1894.

⁸ Jour. de Méd. de Paris, Feb. 17, 1895.

⁹ Ann. des Mal. de l'Oreille, June, 1895.

¹⁰ Medical Press, London, March 6, 1895.

¹¹ Praeger Vierteljahrschrift, p. 33, 1866.

furunculosis in the ear. The best communication on this topic emanates from Randall's department of the Polyclinic, Philadelphia.¹ [Antisepsis is to be relied upon for relief of this usually artificial disease, produced by picking and swabbing the ear, whereby septic matter, usually the staphylococcus, is imbedded in a hair-follicle or sebaceous gland. Incisions do more harm than good in this disease, as they supply fresh furrows for implantation of septic germs. As furuncles do not occur in the osseous part of the auditory canal, it is folly to advise "incisions down to the bone," as some writers on this subject have done.² We have found that "black wash" relieves the burning pain in the early stages, and that frequent instillations of from 5 to 10 drops of a 20 per cent. mixture of ichthyol in glycolin is the best germicide and preventive of recurrence of boils.]

Foreign Bodies in the Ear.—[In regard to foreign bodies in the ear, the first and important injunction is to be sure that there is a foreign body in the ear before endeavors are made to extract it. Much damage has been done to the ear by groping after a foreign substance³ said to be in the ear which was not there and never had been there. In no case should any one not a specialist use any form of surgical instrument to extract a foreign body from the ear. If a living insect has entered the ear, a few drops of sweet oil will smother it, and it may then be syringed out with warm water. If an inanimate substance has been placed in the ear, as is often done in play by children, syringing with warm water will generally remove it if the ear has not been previously scratched by probes or forceps. If the latter has been done, the child should be etherized and the foreign body removed by an expert. There is no hurry demanded in such cases. The foreign substance had better be left in the ear indefinitely than to apply rough measures for its removal. What a child can slip into the ear in play can be easily removed if the physician first called knows how to do it. Unless he knows what to do and what not to do, he had better do nothing. It will be better to send the patient to the nearest aurist than to do the wrong thing for relief. Death has occurred by unskilful endeavors to remove a foreign body from the ear of a child. Not the foreign bodies in the ear, but the improper treatment, is the cause of death in such cases.]

Tansley⁴ observed a diamond in the external canal of a child, and he removed it under chloroform. The mother of the child had pushed the foreign body farther inward in endeavoring to remove it, and wounded the canal. That foreign bodies are easily removed from children's ears by an expert, if no unskilful hand has previously lacerated the auditory canal, is shown recently by Tomka.⁵ We must beware of meddlesome, unskilful, and infectious aural surgery. Haug⁶ records two cases of foreign bodies in the ear, in one of which the disadvantage of unskilful treatment is shown.

¹ Polyclinic, Feb. 2, 1895, p. 46.

² Med. News, Phila., Jan. 19, 1895.

³ Barclay: Polyclinic, Oct. 13, 1894.

⁴ Archives of Pediatrics, Aug., 1894.

⁵ Internat. klin. Rundschau, Vienna, Oct. 14, 1894.

⁶ Münch. med. Wochenschr., 1894.

In the other the foreign bodies (two beads) lay twenty-eight years in the canal without doing any harm. Schmiegelow¹ reports a foreign body forced into the drum-cavity from the external ear, followed by rough extraction, great irritation, tetanus, and death. Voss² of Riga reports a case of fatal meningitis, in a child of five years, induced by rough endeavors to extract a bean from the external ear.

[We consider the instillation of oil³ into the ear for the removal of foreign matter from it as futile.]

Living Larvæ in the Human Ear.—D'Aguanno⁴ gives an account of two instances of the occurrence of living larvæ of the *musca sarcophaga* in the ears of children. In one of the cases the larva entered the drum-cavity through a rupture in the tympanic membrane. In both cases the maggots were removed by forceps. [It is best to put into the ear a drop or two of chloroform or ether if maggots are found to have secured a lodgement therein.] Haug observed a tic (*ixodes ricinus*) in the ear of a lad seventeen years old. The creature was killed by a mercuric-chlorid solution and removed with a probe.⁵ Haug⁶ has also observed emphysema of the tympanic membrane and mastoid region following powerful inflations of the nasopharynx.

DISEASES OF THE MIDDLE EAR.

Acute Otitis Media.—*Treatment.*—[A knowledge of bacteriology has revolutionized the treatment of otitis media, as it has of most diseases. At least five different pathogenic organisms are known to be the cause of acute otitis media. The rational treatment of acute otitis media, therefore, cannot consist in a destruction of the infectious microorganisms *in loco*, but, since in the ear, as in other organs of the body, the inflammatory process engendered by them runs its regular course by stages, the task of the physician must consist in promoting this natural course of the disease in the ear and placing the general system in a position to withstand the infection.⁷ Nature shows us by the early spontaneous rupture of the tympanic membrane in the previously healthy ear what is best for the acutely inflamed ear—viz. the escape of the pathogenic microorganism. Not only must this fact be remembered, but it should also become apparent to the reflecting mind that nature will further resent the entrance of fresh infectious germs from without. Therefore not only should the exit of the pathogenic germs already in the middle ear be promoted, but the surgeon should be careful not to throw irritating infectious matter into the ear after either spontaneous or artificial perforation of the membrana has occurred. The old plan of preventing suppuration, if possible, and, if it ensued, of injecting irritant and unsterilized fluids into the

¹ Revue de Laryngol., etc.; Archiv f. Ohrenh., Bd. 59, May, 1895.

² St. Petersburger med. Wochenschr., June 10, 1895.

³ Ziem : N. Am. Practitioner, Aug., 1894.

⁴ Ann. des Mal. de l'Oreille, Aug., 1894.

⁵ Münch. med. Wochenschr., 1894.

⁶ Ibid.

⁷ Gradenigo and Pes: Archiv für Ohrenheilk., Dec., 1894.

ear, was based on ignorance of the cause and course of acute otitis media, and belongs to the days of what may be termed septic surgery.

If acute otitis media is seen in its earliest stage—*i. e.* when the pain has lasted but a few hours, or when it has diminished to some extent, and when the membrana tympani is reddened only in its upper segments, and the hearing is still fairly good—then an abortive treatment may be tried. This will consist in rest in one's room or in bed, with the head high in most cases, light diet, gargling antiseptic sprays to the nasopharynx if indicated, and instillation into the ear of a 1.50 or 2.00 per cent. watery solution of phenol. This is advisable because of its antiseptic and anesthetic properties. Solutions of phenol in glycerol or oil are irrational, because both of these excipients practically nullify the antiseptic action of phenol.¹ We have observed, however, that no form of instillation is borne by the membrana tympani in the early stages of acute otitis media when the membrana is congested and the ear aches. Therefore it is our custom to apply *dry* heat to the ear in acute otitis media, instead of any form of drops in the ear, as we have never found any kind of instillation that would give relief to earache, but, on the contrary, that instillations into the auditory canal tend to further irritate the already inflamed membrane, and complicate the condition by adding to the congestion and pain. But dry heat never has done any harm, and in the vast majority of cases in which it has been applied to the ear at the outset of the pain it has exercised an abortive influence over the congested tympanum. Since the success of dry heat in acute otitis media is so much greater than that following hot instillations of any kind, the conclusion is inevitable that the latter are likely to do more harm than good; though if a fluid application is desired in the early stages of a case of acute otitis media, the 1.50 or 2.00 per cent. watery solution of phenol is the only one that should be used. But the membrana may not be able to bear even the mechanical pressure of the column of any fluid dropped into the ear.

If the so-called abortive treatment fails, the pain continuing for from twenty-four to forty-eight hours longer, and the otoscopic and functional symptoms of suppuration in the drum-cavity are apparent, then without further delay generous vertical incision should be made, usually in the lower posterior segment of the membrana tympani. Before this is done the auricle should be cleansed with a warm solution of mercuric chlorid (1 : 1000), and some of the same kind of antiseptic solution instilled into the ear. Then a few drops of a 10 per cent. solution of cocaine in 1 per cent. phenol solution should be placed in the ear and allowed to remain a few minutes. This produces a fair local blunting of sensibility, but not an entire local anesthesia, and the paracentesis may be performed without much pain to the patient. Experience has taught some aural surgeons that, when practicable and not contraindicated, general anesthesia is preferable to local anesthesia when paracentesis of the membrana is to be performed, because the patient will be perfectly still under the former, as he will not be under the latter, and

¹ Ceppi : Correspondenz-Blatt für Schweizer Aerzte, 1893, No. 23, p. 788.

therefore the surgeon can make not only a better, more generous, incision under the former conditions, but he may make two incisions if desirable, whereas the second incision under the local anesthetic will not be permitted by the conscious and somewhat hurt patient. The so-called "abortive"¹ treatment may fail to arrest the disease, but before paracentesis is demanded or can be performed—and few general physicians are competent to perform it—a spontaneous rupture of the membrane may occur. But this should not be waited for more than forty-eight hours. If spontaneous rupture does not occur then and the pain continues, paracentesis must be performed, for the pathogenic microorganisms penetrate deeper into the ear and threaten the cranial cavity. Furthermore, inspissation of the pus lying against the inner surface of the drum-membrane ensues, and forms a barrier against spontaneous rupture of the now practically thickened membrana tympani. But the life and the hearing of the patient are now threatened by the retention of pus, and paracentesis of the membrana becomes a *vital indication*. Paracentesis of the membrane, when deferred to the second, third, or fourth day of pain, does not always give immediate relief to the pain, nor is it always followed by a flow of pus, especially when inspissation of pus has occurred in the drum-cavity. But generally in such cases in a few hours a flow of pus takes place and the pain diminishes or ceases entirely.

As the outflow of pus is the escape of morbid microorganisms from the middle ear, every effort must be made to promote its escape and prevent the too early closure of the perforation in the membrana tympani. "The best way to accomplish this end is by drainage of the auditory canal. After spontaneous or artificial perforation of the membrana has occurred, the discharge should be gently mopped out of the canal without touching the membrana tympani. *No syringing the ear should be practised unless the exudation is very excessive*; then the canal may be very gently syringed with a warm solution of mercuric chlorid (1 : 10,000). Afterward, under careful illumination of the external auditory canal, a thin strip of iodoform-gauze may be introduced with a slender probe or slender forceps down to the sulcus of the bony auditory canal, very near the sulcus tympanicus, but not far enough to touch the membrana tympani, which would be irritated thereby. Over the outer end of this drainage strip, in the meatus, several layers of iodoform-gauze may be laid so as to fill the concha. If the discharge is excessive, an occlusive dressing of gauze and cotton wool may be placed over the drainage strip, and the whole allowed to remain in position twenty-four hours. In some cases of excessive discharge or for any other reason this dressing may be renewed twice daily."² It seems, however, in the majority of cases, especially when entirely in the hands of the nonspecialist, a gentle cleansing of the auditory meatus and canal, by means of syringing with a warm solu-

¹ Dr. J. Müller of Vienna demonstrates the abortive effect of early paracentesis in acute otitis media. That such may be the effect of early paracentesis is well known to all aurists. Wiener med. Wochenschr., Oct. 27 and Nov. 3, 1894.

² Gradenigo and Pes, loc. cit.

tion of mercuric chlorid (1 : 10,000) once in twenty-four hours, will be quite sufficient; in fact, it will be impossible for any one but the specialist to properly insert the drainage strip of gauze as described above. After the cleansing of the canal by syringing as described, the meatus may be gently stopped with a small tampon of iodoform-gauze or iodoform-cotton, simply to prevent the entrance of pathogenic germs into the auditory canal and thence into the middle ear. If the iodoform dressings irritate the skin of the auricle, as they do sometimes in children, boric-acid gauze or carbolic-acid gauze may be substituted. Secondary infection of the middle ear may also be avoided by refraining from *all forms of inflation of the tympana* in acute otitis media, when the secretions in the nasopharynx are copious, and of course loaded with pathogenic microorganisms, which are easily launched into the middle ear, or ears, by any form of inflation of their cavities. We should therefore favor the exit of the exudation from the middle ear, as described above, and prevent the artificial *entrance of fresh disease-germs* into the middle ear either by way of the external ear, or Eustachian tube, by refraining from inflations, syringings, etc. The discharge will then soon cease, the perforation in the membrana close, and the hearing grow better in from two to three weeks, and in most cases the ear will be entirely restored to its functions under this gentle and rational antiseptic treatment. In the ear as elsewhere in the body little or no active treatment is often the best treatment.

The wisdom of this treatment is shown by Lermoyez and Helme,¹ and secondary infection of the middle ear explained. This article, like that of Gradenigo and Pes, shows us that the presence of streptococci or pneumococci in the middle ear is the most frequent cause of acute otitis media, while chronic purulent otitis media is caused by the presence of staphylococci in the middle ear. These views are further upheld by the valuable work of Martha.² This secondary infection of an otitis media by staphylococci of various forms (*staphylococcus albus* being the one most frequently found) is due to their conveyance either through the Eustachian tube or through the external auditory canal to the middle ear, after either spontaneous rupture or paracentesis of the membrana tympani. According to the observations of Lermoyez and Helme, it seems most probable that secondary invasion of the drum-cavity takes place through the external auditory canal after perforation of the membrana.

Having established this point, the authors show most conclusively that these infecting staphylococci are conveyed to the middle ear by the patient and by the physician. Acute purulent inflammations of the middle ear are monomicrobial at the beginning, the usual factors in their origin being the streptococcus or the pneumococcus. Later, a secondary pyogenous infection

¹ *Annales des Maladies de l'Oreille*, etc., January, 1895. The same authors extend their valuable investigations upon this subject into rhinology and laryngology (*Ann. des Mal. de l'Oreille*, vol. xxi., June, 1895).

² *Des Microbes de l'Oreille*, Steinheil, Paris, 1893.

occurs, engrafting itself upon the original factors, and substitutes itself for the primary affection, which has gradually subsided, interferes with its cure, and leads to its passage into chronicity. This secondary infection is nearly always due to pyogenous staphylococci, especially to the staphylococcus albus. These microbes reach the middle ear usually through the perforation in the membrana tympani. They come from the external auditory canal, where they have either preexisted in the cerumen, or where they have been placed by objects used in the treatment of the ear. The white staphylococcus, which in two-thirds of all cases is the only pathogenic element found in the pus of chronic otorrhea, is nearly always found in the cotton employed and inserted in the usual way for cleansing the running ear. Therefore, perhaps the physician unconsciously contributes toward the chronicity of an otorrhea by conveying from his fingers the staphylococcus albus to the cotton he twists on the cotton-holder for cleansing the ear. In fact, a number of cotton-tufts already twisted and ready for use in the running ear were taken by Lermoyez and Helme and carefully placed in culture and finally examined. Every one contained flourishing colonies of staphylococcus albus. It follows from this that patients should not put any kind of cotton in their own ears, especially when acutely inflamed and running, and that the surgeon should avoid mopping the ear with cotton-tufts contaminated by his own fingers, no matter how carefully washed the latter may be. Lermoyez suggests that when the ear is to be mopped with cotton the latter may be twisted as usual, and then dipped in a saturated alcoholic solution of boric acid, which should be ignited and blown out as soon as the resulting flame gives the characteristic greenish tint, or in about five seconds. [But we have found that this occurs before the tuft is dry. If this procedure is pushed until the cotton is dry, scorching of the tuft ensues, and this, requiring trimming with freshly sterilized scissors, renders the method useless for even reasonably rapid work. We therefore twist 5 per cent. boric-acid cotton, or simple absorbent cotton, upon the cotton-holder, subject it a moment only to the flame, blow it out instantly, and thus have a dry sterilized tuft for mopping the purulent ear in less time than it requires to write the description of this method.]

Unless some such method of inserting into the ear sterilized cotton is employed, there is every chance of the surgeon's contributing to the continuance of suppuration in an ear by conveyance of staphylococci from his own fingers into the external and middle ears.

The long list of sequelæ of acute otitis media would never have occurred had the original treatment of the acute otitis media not been such as to favor a secondary infection of the drum-cavity by way of the external ear, and possibly through the Eustachian tube; for the staphylococci, the efficient element in this secondary invasion of the drum-cavity, after rupture of the membrana tympani may be conveyed from the nasopharynx and mouth, where they are always present, by various modes of inflation of the middle ear, up the Eustachian tube. Even most medicaments put into the running ear will irritate it—that is, secondarily infect it—from the presence of pyo-

genic germs invariably present in all domestic remedies and even in many of those compounded at the druggist's. If the ear, before it runs, could be syringed with a weak mercuric-chlorid solution (1 : 5000 or 1 : 10,000), and then, when it begins to run, drained with a narrow strip of iodoform-gauze or phenol-gauze, and let alone for twenty-four hours or even longer, the primary disease would generally heal in four or five days, and no secondary infections by artificial means would succeed it. Corroborative assertions of the value of this treatment in ear-diseases are given also by Hamon du Fougeray.¹

Collodon,² like Szenes,³ prefers to cure suppuration of the middle ear by the induction of suppuration outside of the ear. The idea in all cases is most unscientific in our opinion, and is to be regarded as an attempt to revert to the septic practice of counterirritation.

Maxillopharyngeal abscesses may lead to ulceration of the internal carotid, with involvement of the external ear, as shown by Meslay,⁴ or involvement of the middle ear (acute otitis media), as observed by Broca.⁵

Otitis Secondary to Exanthematous Disease.—The conclusions of Blaxall,⁶ in a bacteriologic study of the suppurative ear-discharge occurring as a complication in scarlet fever, are similar to the foregoing as to cause. Zaufal⁷ describes a rare case of actinomycosis of the middle ear with actinomycotic abscesses about the mastoid process in a farmer fifty-six years old. The actinomyces were found in the secretion coming from the hard, sluggish abscesses in the mastoid region and in the mastoid cavity ; but their presence in the tympanum was not proved. In fact, from the absence of earache and from the imperforate membrana tympani we are inclined to doubt their existence at any time in the drum-cavity in this case.

Downie⁸ has showed that tympanic involvement was due in 26.1 per cent. of cases to measles, in 12.6 per cent. to scarlet fever, in 29.4 per cent. to a catarrhal origin, and in 20 per cent. to the eruption of teeth, in children under twelve years of age. The otitis media in them is due not so much to direct extension of inflammation from throat and nose, by the Eustachian tube, to the middle ear, as by the sealing or plugging of the mouth of the Eustachian tube by the retained mucus in the nasopharynx, the damming then of mucus in the ear, with consequent distention, extravasation, and pain in the ear,—all favored by the recumbent position. Therefore the treatment should consist first in vigorous blowing and cleansing of the nose, if possible, and *gentle Politzer inflation, chiefly for dislodging mucous*

¹ Annales des Maladies de l'Oreille, vol. xxi., June, 1895.

² Archiv f. Ohrenh., Bd. 38, April, 1895.

³ Ibid.

⁴ Bulletin de la Société anatomique, Dec., 1894, p. 948.

⁶ Annales des Mal. de l'Oreille, vol. xxi., May, 1895 ; Conrado Conradi : "Treatment of Acute Otitis Media," Archiv f. Ohrenh., Bd. 39, May, 1895 ; Turina : "Pyemic Complications of an Epidemic Nature in Fifty-six Cases of Acute Otitis Media," Archiv f. Ohrenheilk., Bd. 39, May, 1895.

⁶ Brit. Med. Jour., July 21, 1894.

⁷ Prager med. Wochenschrift, July 5 and 19, 1894.

⁸ Brit. Med. Jour., Nov. 24, 1894.

plugs from the nasopharynx, and, if these methods give no relief to pain and deafness, resort to paracentesis of the membrana. Blisters, leeching, application of Leiter's coil, and the like to relieve earache may be regarded [very justly] as an "evidence of ignorance of the condition under consideration" and as loss of valuable time. Phillips¹ also recommends great caution in the use of any form of inflation of the tympana in such cases, lest septic matter be forced into the middle ears. Haug² observed acute otitis media and empyema of the mastoid following the careless use of the nasal douche in nasopharyngeal catarrh.

[We regret to be obliged to condemn the method of evacuation of the tympanum by alternate condensation and rarefaction of the nares and nasopharynx, by means of a bulb-syringe, recommended by Fraser.³ Such a method of treatment of inflamed nares and nasopharynx would surely force septic matter into both tympana, and dry-cup the nasopharynx and Eustachian regions, resulting in extravasation and rupture in the delicate mucous lining of these structures.]

The "stopped-up" feeling in the ear in the early stages of coryza is shown by Randall⁴ to be due not to secretion in the tympanum, but to a vacuum in the drum-cavity by the unconscious performance by the patient of the "negative" Valsalvan or Toynbee exhaustion of the air in this cavity. He shows that cocain, though relieving this condition at first, is followed by obstinate secondary relaxation, requiring gentle alkaline spraying, followed by an oily spray, like glycolin or fluid petrolatum, in which menthol and camphor, of each one grain, are dissolved, and then, according to his experience, light insufflations or dusting of the affected parts with calomel. But no inflations of the nasopharynx and middle ears are recommended in this condition by this writer.

[Much has been written on acute otitis media, but most of it has been written from the wrong point of view: the writers either fail to record the erroneous treatment of the ear in the stage of acute inflammation, or, recording it, fail to see that the physician or the patient, or both, have by septic treatment set up the secondary inflammation in the ear by the introduction of staphylococci from without.] Thus, in two cases reported by Stout⁵ secondary infection of acute purulent otitis occurred in the interval of withdrawal from the careful antiseptic treatment in his clinic, and in both instances secondary mastoiditis occurred; one of the cases assumed the so-called Bezold form, with burrowing of pus along the digastric furrow beneath the deep cervical fascia. Both cases were finally operated upon with success. But had these cases not withdrawn themselves from proper treatment of the acute otitis, and secondarily infected their tympana by domestic treatment, always septic, they would have escaped mastoiditis.

¹ Am. Med.-Surg. Bulletin, New York, March 15, 1895.

² Münch. med. Wochenschrift, Aug. 28, 1894.

³ Med. News, Apr. 27 and May 18, 1895.

⁴ Phila. Polyclinic, May 4, 1895.

⁵ Ibid., Feb. 9, 1895.

Several important facts in the symptomatology of otitis media in children have been recorded. The symptoms of acute ear-disease in infants consist in restlessness, fever, and loss of weight; but sometimes there are no such symptoms. Inflammation of the middle ear is very often associated with bronchopneumonia, and it is probable that both conditions may be caused by aspiration of deleterious substances at birth. Death may be due to gradual wasting from the ear-disease, or may be caused by a secondary infection of the cerebral meninges or by septicemia. In the case of one infant, Kosser¹ found a pure culture of the bacillus pyocyaneus² in the pus on the pia mater and in the blood of the heart, and the same bacillus, associated with Fränkel's diplococcus, in the ear and lungs. When all symptoms are absent no special treatment need be adopted, but when one or more symptoms are present the pus must be let out by paracentesis of the membrana tympani. If the ear has not been examined, the fever due to ear-disease might sometimes have been falsely laid to the charge of a lung-affection.

Torticollis has been cited by Gellé³ as a symptom of ear-disease. It appears to be of frequent occurrence in France in patients of all ages and with all forms of ear-disease. [According to our experience, it is rare in this country.] If torticollis develops in infants or small children, the ear should always be examined, and, according to Gellé, the cause of the muscular contraction often will be found to lie in the organ of hearing in the form of either acute or chronic purulency. Crockett⁴ has observed torticollis in connection with otitic sinus-thrombosis.

Otic Facial Paralysis.—Lannois⁵ of Lyon very wisely concludes that facial paralysis attributed to cold is often due to an otitis media not clearly defined. The symptoms, fever, earache, and deafness, often associated with the facial paralysis, point to the true origin of the latter symptom. Such paresis is usually easily cured if the treatment of the ear is a proper one.

Teeth and Ears.—Attention is again called by Turnbull to dentition and diseases of the teeth as causes of ear-disease,⁶ as it has been very often and thoroughly before by many other aurists, notably by Rau of Germany as early as 1856, and Sexton of New York in 1888, and before. Timely caution should be given, in an article like that just mentioned, to either let the running ear alone or to form drainage by antiseptic gauze. Instillation of anything into the acutely inflamed and *running* ear is generally a mistake. There is more probability of introduction of the staphylococcus than of favoring the escape of the streptococcus. We are reminded by Minor's article⁷ that the cerebral disturbances often observed in intestinal and other disorders in children, and referred to the latter diseases, are in reality very

¹ Hartmann : Deutsche med. Wochenschrift, June 28, 1894.

² See review of article by Pes and Gradenigo, Ann. des Mal. de l'Oreille, April, 1895.

³ Ann. des Mal. de l'Oreille, April, 1895.

⁴ Am. Otolog. Soc., 1894.

⁵ Ann. des Mal. de l'Oreille, Nov., 1894.

⁶ Med. and Surg. Reporter, Mar. 31, 1895; Atlanta Med. Jour., Nov., 1894.

⁷ Amer. Medico-Surg. Bulletin, Nov. 1, 1894.

frequently due to unsuspected ear-maladies. In all such cases the ear should be carefully examined.

Bishop¹ of Chicago and Dench² of New York have written of the effects of epidemic influenza upon the ear. [There is no difference between acute otitis in grippe and the same disease occurring in any infectious disorder. The treatment of acute otitis media in influenza should therefore be of the same severely conservative and antiseptic form as set forth by Gradenigo and Pes, and not the usually recommended form of deluging the nares with sprays and inflating the nasopharynx and middle ear. Neither should the external ear be filled with hot fats nor the ear syringed with anything after the discharge sets in.]

So-called Diabetic Otitis Media.—There is no specific reason for the causation of otitis media in the diabetic. Acute otitis media is caused in them by "a cold," as in others. In them, as in any other weakened subjects, improper treatment produces readily secondary infections of the middle ear and mastoid.³ The course of the otitic disease is undoubtedly influenced by the diabetic or any other nephritic affection, and may assume an asthenic type, as observed in the cases related by Davidsohn.⁴ The mastoid in no case will become affected if the primary tympanic inflammation is properly treated, and thus secondary infection avoided. In Davidsohn's case copious syringing of the inflamed ear led to the unfortunate secondary results in the mastoid, though the patient finally recovered.

Aural Sclerosis.—Gradenigo of Turin endeavors to show that aural sclerosis is a syphilitic affection in some instances, being a form of tardy hereditary syphilis. It should be counted among parasyphilitic affections in the sense recently defined by Fournier; it is of specific origin, but not of specific nature. A similar view as to its origin is held by Chambellan.⁵ Eeman⁶ reiterates the opinion expressed before by others that aural sclerosis is a disease of cerebral origin, characterized by trophic lesions of the drum-cavity. Elements of the medulla are attacked near the acoustic centre. It is often caused by infectious diseases, roseola, scarlatina, etc. It must be distinguished, however, very carefully from chronic catarrh of the middle ear.

The Middle Ear in Tabes.—The lesion of the middle ear in tabes is sclerosis of the inner wall and on the inner surface of the membrana. This may arise from the changes in the trophic nerve of the cavity, coming from the fifth nerve, which is affected centrally. The sensory and trophic changes in the skin of the auricle and face in tabetics lends support to this hypothesis.⁷ This sclerosis, as well as the lesion of the fifth, and the tabes, may all be parasyphilitic results.

Nose and Ear.—Disease of the nasopharynx is directly causative of

¹ *Medicine*, April, 1895.

² *Med.-Surg. Bull.*, April 15, 1895.

³ Hugo Davidsohn: *Berliner klin. Wochenschrift*, Dec. 13, 1894.

⁴ *Loc. cit.*

⁵ *Ann. des Mal. de l'Oreille*, May, 1895.

⁶ *Ibid.*, Aug., 1894.

⁷ F. J. Collet: *La Presse médicale*, Jan. 12, 1895.

middle-ear disease in from 35 per cent. to 88 per cent. of all cases, according to Alderton;¹ and Morf² also concludes that disease of the middle and inner ears is a frequent complication of chronic atrophic rhinitis; that the middle ear is four times as often affected as the inner ear; that pathologic alterations in the membrana tympani without deafness are rare; that the sex has no influence in the frequency of the aural affection in general, but that the right ear is oftener affected in women and the left in men; that in about one-half of the cases of aural complications both ears are attacked, and in the other half only one ear—in the latter circumstance the corresponding half of the nose is more diseased than the other; that nervous deafness is relatively more frequent in atrophic rhinitis, despite the fact that most of the patients are relatively young, and that the middle-ear disease is generally the consequence of disturbed tubal ventilation; and that the affection of the inner ear must be referred to constitutional anomalies.³

While some ear-patients are benefited by nasal treatment,⁴ many are made worse by it, both in nose and ears, as shown by Seiss.⁵ [In many instances we regret to say that perfectly well ears have been permanently injured by intranasal surgical treatment.]

Deafness occurring in Cerebrospinal Meningitis.—The sudden deafness occurring in the course of cerebrospinal meningitis is very rationally explained⁶ as due to the transmission of a basal meningitis, by the way of the recessus Cotugnii, and thence by the ductus endolymphaticus, to the inner ear, especially in children, in whom the aquæductus vestibuli is relatively larger than in adults. The treatment must begin early and be kept up persistently. Pilocarpin, sodium salicylate, potassium iodid, and mercurial inunctions must be used as absorbents.

The Ear in Apex-catarrh.—Straight⁷ calls attention to the frequent association of middle-ear disease with catarrh of the apex of the lung. When the latter is recognized and treated by creosote, it is claimed the ear gets well.

Otalgia.—It is claimed by Kahn of Würzburg that persistent otalgia is generally due to syphilis of the nasopharynx: therefore the latter cavity should be carefully examined in a case of stubborn neuralgia of the ear.⁸

Olfactory Examination.—Gradenigo⁹ concludes that—1. An olfactory examination can aid in diagnosis even in those cases in which an objective examination of the nose does not give positive results. 2. In cases of profound deafness, with involvement of the middle and internal ears, the existence of a marked diminution in the essential olfactory acuity—that is, one not connected with a respiratory stenosis nor of central origin—would attest the rhinopharyngeal origin of the aural affection.

¹ Annals of Oph. and Otol., Jan., 1895.

² Arch. of Otology, vol. xxiii., 1894.

³ Arch. of Otology, vol. xx., 1894.

⁴ Gradle: Med. Rec., June 15, 1895.

⁵ "Remote Results of Intranasal Operations," Therapeutic Gazette, Nov. 15, 1894.

⁶ Virginia Med. Month., Jan., 1895.

⁷ Med. Rec., Sept. 22, 1894.

⁸ "Syphilis des Nasenrachenraumes und Otalgie," Münch. med. Wochenschr., Dec., 1894.

⁹ Ann. des Mal. de l'Oreille, Aug., 1894.

Auditory Vertigo.—Dalby¹ rejects the term “Ménière’s disease” as in most instances almost meaningless; he agrees with Burnett² that the name should be applied only to those cases in which the internal ear is involved primarily. To those cases in which the external or middle ear is involved Dalby applies the name “auditory vertigo.” Mackenzie³ agrees in the main with the views of Dalby and Burnett. The vertigo in these cases is caused by the irritation of the vestibular nerve conveyed to the cerebellum (Mackenzie). The acute attack should be treated by the recumbent position and bromids. Counterirritation does no good. The middle ear must receive attention, as shown farther on.⁴ Auditory vertigo is said to be caused sometimes by working in compressed air, as in the excavation of tunnels.⁵ The explanation of such an occurrence is that a hemorrhage takes place from the vessels of the semicircular canals, being induced by the difference between the ordinary pressure of the air and that under which the patient works in the tunnel. [Although it is said that this may occur in a previously healthy ear, it is difficult for an aurist to admit such an antecedent condition, because it is in blood-vessels previously weakened by catarrhal processes in the middle ear that we should expect hemorrhage to occur, and a catarrh of the middle ear would be very likely to be induced by working in damp places like a tunnel, and, even without the consciousness of the patient as to its existence, insidiously weaken the vascular system of the middle ear, and secondarily that of the internal ear, and prepare the way for extravasation or hemorrhage.]

For the vertigo of chronic catarrh of the middle ear Burnett⁶ suggests the name of tympanic vertigo, as being more definite and reasonable than Ménière’s disease. It is due to retraction of the membrana tympani and the ossicles, resulting in impaction of the stapes and its pressure upon the labyrinth fluid, the final result of the chronic sclerosis, thickening, adhesions, etc. of chronic middle-ear catarrh.⁷ In such cases of chronic tympanic vertigo the only means of cure is liberation of the stapes. This is best accomplished by removal of the incus, as shown in ten cases reported by Burnett.⁸

Vertigo of Nephritis.—Bonnier⁹ sets forth the fact that in nephritis the labyrinth is a point of lessened resistance, like the capsule of Bowman investing the renal glomerule, with which it presents the greatest morphological resemblance—viz. an endothelial capsule, in which the blood is slowed in its course, and where certain elements of the blood are kept. However, the renal endothelium permits a passage to that which the labyrinth retains,

¹ Brit. Med. Jour., May 12, 1894.

² Phila. Medical Times, June, 1882.

³ Brit. Med. Jour., May 5, 1894.

⁴ “Pathogenesis of Attacks of Vertigo in the Course of Ear-diseases (Ménière type),” Gradenigo, XI. Internat. Med. Congress, 1894; also article by Avoledo, *ibid*.

⁵ Curnow: Lancet, No. 3715, 1894.

⁶ Am. Otol. Soc., 1894.

⁷ First suggested by C. H. Burnett, Phila. Med. Times, June, 1882. See also article by Spear: Boston Med. and Surg. Jour., Nov. 29, 1894.

⁸ Amer. Otol. Soc., 1894.

⁹ Ann. de Méd., Nos. 41 and 42, 1893.

and inversely.¹ In all cases of vertigo careful search should be made for a possible coexistence of symptoms of nephritis.

Nonsuppurative Otitis Media. — In a discussion on the prognosis of chronic nonsuppurative otitis media, with imperforate membrane, Field² presented his conclusions as follows, first as to prognosis based on treatment after removal of every ascertainable local cause in the adjoining regions and after the Eustachian tube has been rendered permeable: 1. From pilocarpin injections, intratympanic and subcutaneous, he has had many good results. The prospects of benefit from this treatment are especially favorable when there is history of syphilis, if there are labyrinthine complications. 2. From operations on the membrane and ossicles, the results obtained by American surgeons after removal of the malleus and incus are so far encouraging as to warrant us in holding out some prospect of relief of certain of the subjective symptoms in patients suffering from advanced sclerosis. That is to say, they will in all probability obtain amelioration of the tinnitus and vertigo, and, perhaps, gain some improvement in hearing.

He then sums up as follows: 1. Prognosis in chronic middle-ear catarrh is most favorable in children and young adults, in whom the cause is plainly attributable to local and removable obstruction, nasopharyngeal or faucial abnormalities, or to simple mucous obstruction of the Eustachian tube from a common cold or other temporary catarrhal condition, the result of inflation and other tests satisfying us that secondary changes have not yet occurred to impede the functions of the membrane and ossicles. 2. When, from whatever cause arising, or however long or short the duration, or from the age of the patient and other circumstances, the hearing power after inflation is recovered in part only, the inference is that consecutive changes due to organization of secretions have already commenced, and that slowly or quickly, depending upon a number of conditions already detailed, the disease will continue to develop, no matter what treatment be adopted. 3. The prognosis is unfavorable when, with much deafness, there is no improvement whatever after forcible catheterization, dilatation of the Eustachian tube, removal of secretions, or the intratympanic injection of solvents. [No good could ever be derived in any case from "forcible" treatment nor "intratympanic injections."] 4. The prognosis is absolutely bad (still as regards improvement) when the symptoms point to primary sclerosis; and worst of all (as regards in this case retention of any hearing power) when, with or without sclerosis, the tuning-fork tests point to serious labyrinthine disturbance.

Barr followed in the discussion, and said that, in his opinion, we have not yet at our command sufficiently reliable information in the form of statistics as to *results of treatment* to throw much light upon the prognosis of this affection.

Grant expressed himself as largely in accord with the views of Field

¹ Ann. des Mal. de l'Oreille, Aug., 1894.

² Brit. Med. Jour., Nov. 24, 1894.

and Barr. The element of sex had forced itself upon his notice as of great importance. He had been greatly struck by the relative frequency and obstinacy of cases of chronic catarrh of the tympanum occurring in young girls, as compared with those in young male patients. As possible causes of the *fact* he suggested—(1) Relative constitutional and nervous debility; (2) the toxic effect of the chronic constipation so habitual in young girls; (3) catarrh acquired and repeated, owing to imperfect drying after washing of their long hair; (4) a neurotic or hysterical affection behind the catarrh; (5) the periodic disturbances of physiologic balance peculiar to the sex. Lennox Browne considered that the one great indication for treatment was to ensure an absolutely free nostril by the removal of all obstructions to nasal patency, whether hard or soft. He also deprecated the use of steam inhalations and of aqueous nasal douches in cases of hypertrophic rhinitis, as tending only to increase the already “water-soaked” condition of the turbinal coverings. Love said: “In cases in which there is no removable cause in the nasopharynx, when the patient is over fifty, and when no operative procedure is likely to do good, . . . inflation by catheter for a period of three weeks appears to be sufficient for the formation of a definite opinion in the typical case of nonsuppurative catarrh. If improvement does not follow, the patient should be frankly told that treatment is not likely to do good.” [“Inflation by catheter for a period of three weeks” is, to say the least, a vague statement. No case of nonsuppurative catarrh of the middle ear requires inflation of any kind more than thrice a week, and that preferably by Politzer’s method. But even this will do no good in three weeks or thirty weeks if “there is no removable cause in the nasopharynx, when the patient is over fifty, and when no operative procedure is likely to do good.”]

Downie thought much valuable time is often lost by prolonged dependence on the use of inflation alone, and pilocarpin hypodermically is of little value in middle-ear sclerosis. When the otitis is of a distinctly catarrhal character, prognosis is favorable if appropriate treatment be applied early. Permeyan thought inflation might be continued for six months [times of repetition and exact method not given] without risk of material harm. Hill thought that in chronic aural catarrh the presence of soft obstructions in the nose and pharynx renders the prognosis more favorable than in the cases with hard, rigid obstructions, such as spurs and deflections of the septum. As a last resource, the use of the “Eustachian bougie” through the catheter was advocated by him. Johnson thought the prognosis bad in chronic cases of *long standing*. Hearing better in a noise is not always an unfavorable symptom, as he has seen several exceptions to this. He has found many cases of chronic middle-ear catarrh in females in a lowered state of health, and he regarded the prognosis as bad. Knapp alluded to the methods of treatment resting on “the surgical principle of treating stiff joints by forcible movements.” The first one is by the electric vibrophone, which has produced but an evanescent improvement in hearing;

the second is the "pressure-probe" of Lucac, with which ten to fifteen short successive pressures are made upon the short process of the malleus. Lucac claims that in a certain percentage of cases the treatment has been highly gratifying. [It is impossible to see how so rough and bruising a method of passive motion could fail to do harm.] Pegler spoke of the advantages of the self-inflator of Dundas Grant. The air in this little instrument is charged with chloroform-vapor. [This is not new, however.] Being entirely in the hands of the patient, the evils of hard inflation are likely to be avoided. He also alluded to Dench's graduated Rinne's test, with forks from C_2 to C_5 . If the test is negative for the whole series, the prognosis is less favorable than when it is positive for the high-pitched ones. He spoke favorably of injections of menthol in parolein, which he has used for two years. [Strength not given.]

Milligan said that, speaking generally, he found that "in those cases in which objective evidences of disease are well marked, when little or no improvement follows free inflation of the middle ear, when tinnitus is constant and severe, when cranial perception of sound is diminished, when the general health of the patient is poor, when a marked hereditary tendency exists, and when the surroundings of the patient are unhygienic, the prognosis is bad."

The Ear in Influenza.—Barnick,¹ like Moos and Gradenigo, claims that the internal ear is affected in some cases of influenza (7 in 13). Dench² observed the involvement of the labyrinth or auditory nerve-trunk in a case of influenza, and regards the disturbance as probably angioneurotic in character.

The Ear in Tabes.—In tabetics there is "a macroscopic atrophy of the auditory nerves (Strümpel), a degeneration in the columns of Goll in the bulb, and a general ependymitis in the floor of the fourth ventricle, with an atrophy of the greater number of the fibers ascending from the nucleus of the auditory nerve to the nucleus of the fifth" (Oppenheim and Siemerking). Habermann has demonstrated changes in the nerve-tissue in the cochlea and vestibule; also shrinking in the root-bundles of the auditory nerve, thus showing an anatomical basis for the auditory troubles.³

Polyp in the Eustachian Tube.—Haug⁴ describes a case of polyp (a fibrosarcoma) of the Eustachian tube in a boy seventeen years old. Such growths in the Eustachian region are very rare. The tumor originated from the cartilaginous part of the tube.

So-called Hysterical Deafness.—Several articles⁵ have appeared upon

¹ Archiv f. Ohrenh., Bd. 38, Apr., 1895.

² Medico-Surgical Bulletin, April 15, 1895.

³ F. J. Collet: La Presse méd., Jan. 12, 1895; and Practitioner, London, May, 1895.

⁴ Archiv f. Ohrenh., Bd. 38, Apr., 1895.

⁵ W. B. Ransom, M. A., M. D.: British Med. Journal, March 2, 1895; Sir W. B. Dalby, F. R. C. S.: *ibid.*, Mar. 16, 1895; Dr. Hector Mackenzie: *ibid.*, March 16, 1895; W. B. Ransom, M. A., M. D.: *ibid.*, May 4, 1895; W. T. Van Dyck, M. D.: *ibid.*, May 4, 1895; Rohrer of Zurich: "Hysterical Deafness and Torpor of the Acoustic Nerve," XI. Internat. Med. Congress, Rome, 1894; Gradenigo: "Diminution of Hearing of an Hysterical Nature

so-called "hysterical" or functional deafness and deaf-muteness. [We agree with Dr. Dalby that there is no such thing as "hysterical loss of hearing," and that all such cases of sudden and mysterious loss of hearing and speech are simulations. We have observed a remarkable case of sudden loss of hearing and opisthotonos in a young woman of seventeen, who afterward confessed that all the symptoms were assumed from morbid erotic motives. Strong electric currents were too much for her to contend against.]¹

Sudden deafness, supposed to be due to acute exudation or hemorrhage in the internal ear, has been observed by Tansley² in a child six years old. Pilocarpin injections were not tolerated, but under the use of from 15 to 60 drops a day of a saturated solution of potassium iodid the hearing was restored in two weeks. Four cases of disease of the labyrinth—chronic deafness, tinnitus, and vertigo—are reported by Baron³ as benefited by injections of pilocarpin.

Syphilitic deafness, sudden in onset, caused probably by a lesion in the nervous centers or in the labyrinth, has been observed by Hermet and Barthelémy.⁴ In the case reported by the latter the disease was classed as hysterosyphilis.

Otoneurasthenia, essential and secondary. and Neurasthenia due to Ear-diseases and to Rhinopharyngitides.—Both forms of otoneurasthenia, named above, are of vasomotor nature and cause labyrinthine excitations.

General neurasthenia with cerebral characteristics may be due to ear-disease and to chronic pharyngitides. Rhinopharyngeal diseases may be associated with general neurasthenia, in which case the subjective symptoms are out of proportion in their severity to the local pathological changes.⁵

Acoustic neurasthenia, due to over-work either of brain or of body, or of both, often marks the first approach of the symptom-complex termed neurasthenia. The victims are usually of a nervous temperament, often becoming hysterical. The treatment is that of general neurasthenia—rest, tonics, and fresh air, the latter being more important than exercise. The prognosis is good, though relapses may occur.⁶

Aural Inhibitions.—Gellé⁷ points out that aural inhibitions may be due to an excitation originating in another organ or in the organ of hearing itself; thus, a very loud noise suppresses the perception of a feeble sound. Neurasthenics and the hysterics are specially influenced by excitations in the acoustic nerve, experiencing consequent inhibitions. Such subjects are called by Gellé "inhibitopes."

in Connection with Organic Lesions of the Ear," Italian Archives of Otolaryngology, 1894; Archiv f. Ohrenh., Bd. 39, May, 1895.

¹ See article by Cartaz: *Annales des Mal. de l'Oreille*, June, 1894.

² *Archives of Pediatrics*, Nov., 1894.

³ *Brit. Med. Jour.*, p. 1236, 1894.

⁴ *Annales des Mal. de l'Oreille*, May, 1895.

⁵ Cozzolino: *Annales des Mal. de l'Oreille*, Sept., 1894.

⁶ See paper by Alderton: *Annals of Oph. and Otol.*, Oct., 1894.

⁷ *Annales des Mal. de l'Oreille*, June, 1894.

Intratympanic Surgery in Chronic Aural Catarrh.—Howe¹ expresses the consensus of American aural surgeons regarding the chronic sclerotic cases of aural catarrh when he says that "the advances made in operations on the middle ear have done much to warrant encouragement in a class of cases which, before, we saw go from bad to worse." Dench² reports 63 cases of operation on the ear for the improvement of hearing. The operations giving the best results are synechotomy, ablation of the membrana tympani, ablation of the malleus and incus, with mobilization of the stirrup, and dissection of adhesions between the ossicles and the tympanic wall. Most of these operations were performed under local anesthesia. In 55 instances the hearing was much improved. He presents here the general consensus of opinion on these operations, excepting in advocating total excision of the membrana tympani, which is now pretty generally abandoned as useless if not irritating. All who have operated on the middle ear for the last ten years will agree with him that "both in purulent and nonpurulent cases mechanical mobilization of this ossicle (stapes) gives better results than its extraction."³

Barclay⁴ recommends intratympanic operations, according to the plans of Sexton, Burnett, Blake, and Jack, adapting the methods to the forms of disease, as indicated. He has had good results, and has employed with advantage an adjustable handle with his blades, making the whole shaft one "twice bent (at right angles), with parallel extremities." Gleason⁵ speaks of the advantages of the severance of the incudostapedial articulation as a means of improving the hearing in chronic catarrhal deafness; and, also, of the good effects in improving the hearing in the unoperated ear.

Stapedectomy.—Jack⁶ claims that this operation is more easily performed, and gives better results, the sooner it is performed. He reports a case in which the improvement in hearing has persisted two years after the operation. Blake corroborated the opinion on the advantages of early interference. Jack's later⁷ conclusions are as follows: In cases of nonsuppurative disease of the middle ear, as well as the class of cases the result of a chronic suppurative process, surgical mobilization should first be tried before an attempt is made to remove the stapes, and that most operations for *mobilizing* the stapes or freeing the oval window must be looked upon as largely experimental, and that in many cases a fracture of the crura occurs at the time of attempted extraction, leaving the base-plate. Miot⁸ still adheres to mobilization of the stapes as the best means for relieving the symptoms of chronic aural catarrh. Incision of synechiae about the bonelet, and mobilization or extraction, may be indicated in certain cases of impediment in the stapes, according to Gellé.⁹

¹ Buffalo Med. and Surg. Jour., Sept., 1894.

² *Ibid.*

³ Atlantic Med. Monthly, March 23, 1895.

⁴ Boston Med. and Surg. Jour., Jan. 10, 1895.

⁵ Ann. des Mal. de l'Oreille, June, 1894.

⁶ Am. Otolog. Soc., 1894.

⁷ St. Louis Courier of Medicine, 1894.

⁸ Am. Otolog. Soc., 1894.

⁹ Arch. de Laryngol., Sept., 1894.

Stapedectomy is not approved of by Blake, Cozzolino, Colladon, Gellé, and others. Garnault has reported 3 cases, with success.¹ Burnett² shows that in some cases the stapes remains mobile in chronic catarrhal deafness, for after opening the membrana and extracting the incus the stapes sometimes is found with a probe to be freely movable. Though the tinnitus and vertigo are relieved by the operation, the hearing is unimproved; this demonstrates that deafness in so-called chronic catarrh of the middle ear is not always due to ankylosis of the stapes, but rather to changes in the labyrinth.

Injections of Liquid Paraffin, etc. in Aural Sclerosis.—Broeckaert³ maintains that injections of liquid paraffin possess a great value in rendering the sclerotic tissues of the middle ear more supple and vibratile. In 43 cases there was no improvement; in 8 cases tinnitus ceased entirely in the course of a few months. In the remainder decided improvement in the subjective symptoms was noted. He concludes that no other medicament should be employed for injections in aural sclerosis. Paraffin injections by the Eustachian tube in chronic catarrhal deafness, according to the suggestion of Delstanche,⁴ appear to have been followed by relief to deafness and tinnitus in 22 cases out of 33. [This is practically an extension of the old idea of Kramer of injecting sweet oil into the Eustachian tube to relieve the tinnitus of catarrhal otitis media.]

Barnick claims good results from paraffin injections in cases of acute catarrh of the middle ear.⁵ [In our opinion the same results can be obtained better by injections of fluid petrolatum (glycolin).]⁶

Bronner⁷ claims that good results may be obtained in chronic dry catarrh of the middle ear by intratympanic injections of a 3 per cent. solution of sodium bicarbonate, in equal parts of water and glycerol. [Our experience, like that of most aurists, is that all intratympanic injections of aqueous solutions are harmful.]

Nasal Douche.—Ziem⁸ shows that the Eustachian tube when at rest cannot be penetrated by fluids injected into the nares and nasopharynx. Yet Haug⁹ records a case of otitis media, with empyema of the mastoid, following immediately upon the use of the nasal douche.

Ear-massage.—In a discussion on this subject¹⁰ the general opinion of the members present was that the results of all forms of ear-massage for deafness with vibrophones, pressure-sounds, etc. were valueless, and, in some instances, painful and injurious. However, we note from time to time the

¹ XI. Internat. Med. Congress, 1894; Kessel of Jena: "Tenotomy, Mobilization, and Extraction of the Stapes," *ibid.*; also Goris: "Nine Cases of Mobilization of the Stapes in Chronic Deafness," *Revue Internat. de Rhin. Otol. et Laryngol.* See *Archiv f. Ohrenh.*, Bd. 39, May, 1895.

² *Annals of Ophthalmology and Otology*, July, 1894.

³ *Annales des Maladies de l'Oreille*, Aug., 1894.

⁴ Barnick: *Archiv f. Ohrenh.*, Bd. 38, p. 182, Apr., 1895.

⁵ *Loc. cit.*

⁶ Delstanche of Brussels: "The Uses of Fluid Vaseline in Acute and Chronic Middle-ear Diseases," XI. Internat. Med. Congress, 1894; *Archiv f. Ohrenh.*, Bd. 38, April, 1895.

⁷ *Brit. Med. Jour.*, Oct. 13, 1894.

⁸ *Ann. des Mal. de l'Oreille*, Mar, 1895.

⁹ *Münch. med. Wochenschr.*, Aug. 28, 1894.

¹⁰ *Am. Otol. Soc.*, 1894.

appearance of articles setting forth the value of various forms of periodic massage of the conductors of sound by electromotor probes, etc.,¹ the value of which further experiments must prove. [We are inclined to the opinion that those methods suggested so far are mechanically rough and liable to do more harm than good.]

Systematic Vocal Exercise of the Sense of Hearing.—Very rational is the method of acoustic exercise of the deaf ear in mutes by speaking first the vowels and then isolated words directly into it, without even the speaking-tube, as practised by Urbantschitsch² of Vienna. This method is not new with Urbantschitsch, as Itard, Toynbee, and Benedikt tried it long ago. His results are asserted by Benedikt³ to be improvement in understanding hearing, rather than improvement in hearing—intellectual rather than acoustic—which is admitted by Urbantschitsch. However, the middle ear—*i. e.* the conducting apparatus—must be deeply concerned in the improved perception, as damp weather, catarrhs, etc. temporarily diminish it. Urbantschitsch also claims to have improved the hearing for speech by exercising the ear with musical sounds (harmonica) only, and also that improvement in one ear, the only one exercised, in some cases is followed by improvement in hearing in the ear which has received no direct methodic exercise. These exercises can be stopped when the patient is able to hear his own voice without an ear-trumpet. Relapses are likely to occur. [But the attempt to improve hearing in chronic catarrh of the middle ear by so-called otomassage has no otologic status. The direct conveyance of musical sounds into the ear will tend to fatigue the conductors and the auditory nerve, just like the subjection of the ear to the noise of pounding in a confined space, as in “boiler-maker’s” deafness.]

Electricity in Otology.—Plicque⁴ treats of electricity in ear-diseases under the following heads:

I. The principal results of experiments; as, *A*, Normal excitability of the acoustic nerve; and *B*, Modifications of the normal excitability. Under the latter he alludes to the loss of galvanic vertigo in deaf-mutes.

II. Modes of electrization—*viz.* continuous currents, faradization, and static electricity.

III. Principal therapeutic applications—*viz.* in tinnitus, neuralgic otitis, Ménière’s disease, tympanic opacities, ankylosis of the ossicles, sclerotic otitis media, and deafness the result of disease of the nerve or labyrinth.

Bouyer⁵ recommends the use of the waters of Cauterets, both locally in sprays and gargles and internally, in the treatment of chronic catarrh of the

¹ Lucæ: *Archiv f. Ohrenh.*, Bd. xxi.; P. Garnault: *Société d’Éditeurs scientifi.*, Paris, 1894; Lester: *N. Y. Med. Jour.*, June 8, 1895; Kirchner: *Archiv f. Ohrenh.*, vol. xxxvii., 1894.

² Wiener med. Presse, Oct. 21, 1894; also *Archiv f. Ohrenheilk.*, vol. xxxviii., April, 1895, “Improvement of the Sense of Hearing by Methodical Acoustic Exercises.” See also Goldstein: *Archives of Otol.*, Jan., 1895.

³ *Berliner klin. Wochenschr.*, July 30, 1894.

⁴ *Annales des Mal. de l’Oreille*, Sept., 1894.

⁵ *Gazette des Hôpitaux*, Aug., 1894.

middle ear of secretory form. They are valueless, he thinks, in sclerotic forms.

Of course healthful surroundings, obtained even by change of climate,¹ are of great importance in the treatment of chronic otorrhea, especially in children. Boric acid must be used with caution, both in powder and in solution.² [This means, avoid by its use irritation and secondary infection.]

CHRONIC SUPPURATION OF THE MIDDLE EAR.

[In the treatment of chronic purulent discharge from the ear the patient and his family can do nothing, excepting in some instances to syringe the ear with alcohol once daily, first greasing the meatus with cosmoline to prevent smarting. No syringing with water will ever do any good; rather will it harm by favoring granulations. No form of drops will be of use, and therefore should not be recommended. We cannot approve of the numerous articles containing the advice to drop into the running ear various forms of astringents or watery solutions of even so-called antiseptics. If a chronic suppurative otitis media is curable, it must be treated by the surgeon. He must cleanse the ear by mopping rather than by syringing, and then convey antiseptic solutions by means of the cotton mop to the diseased parts as far as possible. The cotton mop, made of plain absorbent cotton, should first be passed through a flame and then quickly blown out. This destroys the staphylococci that get on it from the surgeon's fingers. Dip the mop in hydrogen dioxid and gently cleanse the ear; then dry it by a mop, always first exposing the mop to the flame as stated. For cases in which there are thick, purulent discharges, after cleansing with mops, as just stated, we rely on alcohol, alcohol saturated with boric acid, alcohol and salicylic acid (20 per cent.), and watery solutions of chromic acid (2 to 3 per cent.), always applied on a mop. If the perforation is small, the mop may be allowed to lie over it for a half-minute. For the thin, mucopurulent and seropurulent forms of chronic aural discharge, after mopping with peroxid mops, the fundus of the ear should be mopped, not with the medicaments just named, but with a mixture composed as follows:

R. Liquor lead subacetate,	℥xx;
Acetic acid, dilute,	℥vj;
Distilled water,	f̄ ʒj.]

Granulations may disappear under alcoholic instillations,³ but not polypi. [The general physician can do no more than this for granulations. If more is demanded, the aurist must do it. Only the aurist can properly remove a

¹ Hessler: Münch. med. Wochenschr., Dec. 11, 1894.

² Sheppard: N. Y. Polyclinic, Aug. 15, 1894.

³ Isaia of Naples: "Treatment of Suppurations in the Middle Ear of Serofulous Subjects," Eleventh Internat. Med. Congress, Rome, 1894. A plea for instillations of alcoholic solutions of Peruvian and Tolu balsams with cocain. [Any efficiency of these solutions must be due to the alcohol.]

polypus and then treat its attachment, the latter being very important. No syringing should be done at any time, as all syringes and syringing are very likely to be septic in their influences, unless precautions are taken that render these procedures nearly impracticable. The tendency has been of late years to do too much for the diseased ear—*i. e.* to put too much into it. Instead of favoring drainage and the exit of septic organisms, septic matters, chiefly the staphylococci, have been inserted into the ear and the *chronic purulency favored*.] The rational treatment of acute otitis media by systematic and gentle tamponment of the external auditory canal with iodoform-gauze is extended to chronic otitis media purulenta, with asserted success, by Hamon du Fongerey.¹ [According to our experience, this can be heartily indorsed. If the simple means suggested do not cure the chronic purulency in a year, or markedly control it, then the necrotic and carious conductors must be excised, drainage thereby improved, antiseptic treatment rendered easier, and mastoid disease, cerebral abscess, sinus-thrombosis, and pyemia prevented.]

Myxosarcoma of the tympanum, following chronic otorrhea in a child one year old, has been noted by Kuhn.² Curetting the growth failed to extirpate it, and death occurred from cachexia three months after the first operation.

Injection-apparatus for the Attic.—Delstanché³ recommends a device of his own, whereby an interrupted current of fluid may be thrown into the attic, which mode he deems more cleansing than a continuous current. Gompertz⁴ of Vienna has devised both stiff and flexible celluloid cannule for cleansing and treating the diseased attic.

Surgical Treatment of Chronic Purulent Otitis.—Tenotomy of the tensor tympani is recommended by Hoffmann⁵ as a conservative method of treating chronic purulent otitis media. [This may prove satisfactory in those cases characterized by perforations below the central line of the membrana, as there is generally in such cases no caries of the ossicles. But in those cases with perforations near the upper end of the hammer, in which caries of one or more of the ossicles is almost invariably found, nothing short of total excision of the membrana and the two largest ossicles will effect a radical cure, thus freeing the patient from the risk of sinus-thrombosis, pyemia, and cerebral abscess.]

Extraction of the hammer and anvil in chronic purulent cases has been followed by good results in the clinic at Halle.⁶ In some instances the operation led to the detection of cholesteatoma in the attic and antrum, not recognized before the extraction of the hammer and incus. The cholesteatoma was then cured. In one of these latter cases, in a boy seventeen years old,

¹ Ann. des Mal. de l'Oreille, June, 1895.

² Deutsche med. Wochenschr., July 5, 1894.

³ Fortieth Annual Reunion of Otolaryngologists of Belgium, Annales des Maladies de l'Oreille, August, 1894.

⁴ Archiv f. Ohrenh., April, 1895.

⁵ Ibid., Aug., 1894.

⁶ Grunert and Meier: *ibid.*, April, 1895.

symptoms developed that led to the diagnosis of basal meningitis, but the patient entirely recovered, notwithstanding the grave complication of meningitis.

In long-continued mastoiditis we should bear in mind the important fact, as recently mentioned afresh by Gleason,¹ that the mastoid process is converted into solid bone. In such cases the attic should first be thoroughly drained by excision of the remnants of the membrana and ossicles, and removal of any synechiæ and granulations found in it. This will often do away with the necessity of trepanation of the mastoid and exposure of the antrum. In fact, in cases of eburnation of the mastoid trepanation is practically impossible. If trepanation is persevered with in such cases, the operator will penetrate the middle fossa of the skull.²

Excision of the malleus as a preliminary operation to opening the antrum in cases of suppuration of the attic and antrum is advocated by Barr.³

The advantages of excision of the ossicula auditus in chronic suppurative otitis media, by the meatus, are ably set forth by Milligan,⁴ and also by Green.⁵ In Dr. Green's 60 cases of chronic purulency, of from five to ten years' duration, various methods of local treatment for periods varying from six weeks to six months failed to relieve. Excision of the remnants of the diseased membrana and carious ossicula cured the purulency in some cases and diminished it in others, and improved the hearing.

Caldwell⁶ also cites the advantages of excision of diseased ossicles in chronic otitis media suppurativa.

Exposure of the Attic.—In order to effect a cure of the processes that take place in the cupola-space (attic), and that include the formation of polypi and the deposition of inspissated or cholesteatomatous masses, sometimes this space must be exposed to view.⁷ Hartmann's article closes with these valuable words: "I find that, *without* going into an elaborate operation for chiselling into the posterior wall of the canal and exposing the tympanic cavity completely, a *permanent* cure may often be obtained by the employment of the tympanic cannula, the removal of granulations by the curet, the extraction of the ossicles, and in some cases by removing a portion of Rivinus's segment with the forceps-chisel." [This is eminently true, and it is also true that when these measures fail to cure a chronic suppuration in the middle ear, which they rarely do, then exposure of the cupola-space or attic-space and the antrum will be sufficient, without chiselling through and away the mastoid. We have seen mastoid operations without excision of the diseased ossicles fail entirely to cure chronic suppuration, which, however, yielded at once to excision of the diseased membrana and carious ossicula.]

¹ Atlantic Medical Monthly, March 25, 1895.

² Zaufal: "Zur Geschichte und Technik der operativen Freilegung der Mittelohrräume," Archiv f. Ohrenh., Aug., 1894.

³ Brit. Med. Jour., Nov. 24, 1894.

⁴ Ibid.

⁵ Boston City Hospital Med. and Surg. Reports, 1895.

⁶ New York Med. Jour., Sept. 8, 1894.

⁷ Archives of Otology, Jan., 1895.

Stacke's¹ arguments in favor of excision of the diseased conductors of sound, and of opening up the middle-ear cavities in chronic suppurative otitis media, are, that carious processes in this region are rarely confined to the ossicles, and yet they rarely go beyond the tympanic cavity. When they do, the probe passed from the attic into the antrum may inform us. The surgeon must then go farther, opening sometimes first the attic and then the antrum by removal of the superior posterior part of the wall of the external auditory canal. In some instances the mastoid cortex must be removed first, and the antrum and attic exposed.

[Regarding the insertion or transplantation of the skin-flap from the auditory canal into the exposed cavities and the maintenance of a permanent opening behind the auricle, we must insist upon the fact, known to all aurists of experience, that nature sometimes cures chronic purulency of the middle-ear cavities without transplantation of skin and the maintenance of a hole behind the auricle.

Many cases of chronic purulent otitis media require a complete exposure of the middle-ear cavities. This can be done in two ways—first, by the method of Stacke, and, secondly, by Zaufal's method. The latter method seems especially indicated when the mastoid cavity and cortex are affected. In Stacke's method the surgeon detaches the auricle and lining of the external auditory canal as far as the membrana tympani, pulls them all forward, and removes by chiselling the pars epitympanica and takes out the ossicles, granulations, synechiæ, etc. from the attic and tympanic cavity. Then the mastoid antrum is inspected and treated as required. The outer part of the posterior wall of the bony auditory canal is left intact. The posterior cutaneous wall of the auditory canal may be split in its long axis, and the flaps thus formed packed into the opening in the bone. In Zaufal's method the operation is begun by removal of the mastoid cortex and the posterior superior bony wall of the auditory canal; then the antrum is laid open, and the pars epitympanica is removed and the attic exposed. Neither operation is indicated in acute cases, as both imply a removal of the conductors of sound. In chronic cases neither should be essayed until the diseased membrana and ossicula have been removed by of course a previous operation.]

[We cannot agree with Zaufal² in his statement that "for the removal of the carious hammer and anvil (or their remnants) Stacke's operation is better than grappling around with hooks in the drum-cavity for the removal of the necrotic tissues in this space." They cannot be compared with each other, and, furthermore, neither plan is indicated for the removal of the membrana and carious ossicula in cases in which the suppurative process is *limited to the middle ear*.

Neither can we admit that Stacke's operation should be performed as "a prophylaxis, especially in children twelve to fifteen years old, against the bad results of chronic purulency of the middle ear, while the disease is still

¹ See article by Vulpius, *Archiv f. Ohrenh.*, Bd. 38, April, 1895.

² *Archiv f. Ohrenh.*, Dec., 1894.

limited to this space."¹ Stacke's operation is applicable especially in chronic purulent processes localized in the attic or in the drum-cavity, such as caries and necrosis of the malleus and anvil and of the walls of the drum-cavity, and also in cases of cholesteatoma localized in the middle-ear cavities.]

Vulpus² endeavors to show the advantages of Stacke's radical operation for obstinate chronic otorrhea.

Jones³ presents a very good statement of the present methods of the radical (surgical) cure of chronic suppuration in the middle ear. When this disease is limited to the membrana, ossicula, and tympanic cavity, excision of the membrana and ossicula, and then the more perfect subjection of the drum-cavity to medication, is the only radical method of cure; and generally this proves efficient. If, in addition to tympanic suppuration, suppuration exists in the mastoid antrum, recourse to the Stacke-Schwartz method of laying open the antrum may become necessary. In eburnation of the mastoid, or hyperostosis or exostosis of the tympanum or external meatus, complicating chronic otorrhea, *no* operation is deemed advisable unless urgent symptoms should arise.

Becc of Liège⁴ reports 3 cases of removal of the malleus in chronic purulent otitis media. The third case presented concomitant symptoms of pyemia, but ultimately recovered. The first case was cocaineized, the second was anesthetized with ethyl bromid, and the third with chloroform.

[MacBride⁵ lays too much stress on opening the middle-ear cavities by the Schwartz-Stacke-Zaufal methods before simple excision of the carious conductors is essayed to improve drainage, which, in the absence of urgent mastoid or intracranial symptoms in chronic purulent otitis media, is all that should be done. This is often sufficient to either cure entirely or markedly diminish and control suppuration in the middle ear.]

Wilson⁶ reports 5 fatal cases of aural suppuration. The ossicles were removed, and finally the mastoid trephined. In the first case there was no intracranial disease, death resulting from accumulation of pus in the mediastinum and lung. In the second case there were thrombosis of the sinuses and pulmonary abscesses. In the third case the mastoid was trephined, but death ensued later from pericarditis. In the fourth case the otitis was complicated by leptomeningitis (cerebrospinal) and invasion of the soft parts. In the fifth case there were marked symptoms of escape of pus from the mastoid cavity, beneath the deep fascia of the neck, behind the line of the sternomastoid muscle.

Barnick⁷ reports 10 cases of operation for throwing all the middle-ear cavities into one: 4 were cases of general caries, and 6 were instances of cholesteatoma of the temporal bone. Although the entire pos-

¹ Page 59, op. cit.

² Med. Record, June 16, 1894.

³ Liverpool Medico-Chirurgical Journal, July, 1894.

⁴ Annales des Maladies de l'Oreille, Aug., 1894.

⁵ Edinburgh Medical Journal, June, 1895.

⁶ American Otological Society, 1894.

⁷ Archiv f. Ohrenh., April, 1895.

terior wall of the osseous canal was removed, facial paralysis was not caused in a single instance. In one instance facial paralysis existing before the operation disappeared after it. One of the healed cases was an otitic pyemia, and another was a spontaneous exfoliation of the cochlea.

The advantages of generous opening of the cavities of the middle ear for the radical cure of chronic otorrhea are shown in a report of thirteen cases by Luc.¹

Chronic Osseous Affections of the Ear.—Schleicher² records a number of chronic osseous affections of the ear, all of which were cured apparently by operative methods less radical than that of Stacke.

MASTOID EMPYEMA AND TREPANATION.

[Of course much has been written on this subject, both by aural surgeons and general surgeons. The so-called indications for and technique of the operation are now universally and distinctly understood and explained. But, after careful perusal of all that has been written on the subject, we are impressed that there is too much haste to flee to this operation, especially in chronic otitis media. In acute otitis media we believe that trepanation of the mastoid is rarely if ever demanded. Surgeons seem to forget that in every case of acute otitis media pus is probably secreted in the antrum and some of the larger mastoid cells, as well as in all parts of the drum-cavity. The position of the latter, being below the antrum, endows the middle ear with a siphonic power, and after the membrana is perforated and the discharge sets in the mastoid antrum and the upper mastoid cells are drained by this siphonic means.

In no case of chronic purulent otitis media should trepanation of the mastoid and exposure of the antrum, as a means of cure of chronic purulency, be performed until excision of the necrotic membrana and ossicula, either by operation through the canal or by means of Stacke's attic-operation, has been essayed. These comparatively simple methods are very often followed by permanent cure of the ear-disease. If the chronic purulency in the ear be attended with lesions of intracranial organs, some form of cranial trepanation in addition to mastoid trepanation will be needed. We have come to the conclusion that in chronic otorrhea a mastoid operation is rarely needed, excepting as a preliminary to deeper intracranial interference for the relief of a phlebitis or an otitic cerebral abscess. The latter operation will be valueless without previously opening freely all the middle-ear cavities. We know that a mastoid trepanation alone, without excision of the membrana tympani and necrotic ossicles, will not cure a chronic otorrhea. And as for trepanation of the mastoid for the cure of pain in nonsuppurating cases, it is gross absurdity.] Jack³ reports a mastoid operation in a case in which the pain was finally shown to be due to neuralgia. No pus was found in the mastoid cavity. Recovery of the wound took place, but the pain con-

¹ *Annales des Maladies de l'Oreille*, June, 1895.

² *Ibid.*, Aug., 1894.

³ *Amer. Otol. Society*, 1894.

tinued. [We feel, therefore, that in the paper of A. Broca,¹ while the anatomy of the parts and technique of mastoid operations are well set forth, the cases he cites were operated upon unnecessarily, especially those in little children, in which the pus was safely pointing behind the auricle when the mastoid was trephined. Of course in such cases pus would be found in the mastoid or antrum. But as the pus was finding its own way out behind the auricle, as it usually does in infants, mastoid trepanation rather retarded than hastened cure. It would be interesting to know what had been done as regards treatment of these little ears before they were deemed in need of mastoid operation. We have never seen a perimastoid abscess without previous otorrhea. And we have never failed to find that that preceding otorrhea had been improperly treated, so as to interfere with natural drainage, to irritate, and to produce a secondary infection. Thus in 3 cases of so-called influenza otitis followed by mastoid empyema and epidural abscesses successfully operated upon and reported by Vulpus,² the mastoid and epidural suppurations were manifestly the secondary result of improper and infectious treatment of the primary otitis media by instillations, syringings, etc.]

MM. Lubet-Barbon and A. Martin³ have made a succinct and graphic report on the treatment of mastoid suppuration. They divide their subject as follows: 1. Mastoid suppurations spontaneously arrested and recovering without operation. 2. Those forming an abscess enclosed within the thick bone, necessitating a trepanation. 3. Those bursting away out of the mastoid cells after having destroyed the osseous cellular walls.

1. The first variety discharge through the drum-cavity and the auditory canal, and should be favored in their course by maintenance of a large perforation in the membrana tympani. [According to our views, most acute cases terminate this way; in fact, in most cases of acute otitis media it is our belief that there is more or less suppuration in the mastoid aditus and antrum, for how else could the large quantity of secretion from the ear be accounted for? These cases empty themselves by the siphonic arrangement of the antrum, tympanic cavity, and auditory canal.]

2. When resolution of inflammation in the first-named variety has not been accomplished, and the abscess has become, so to speak, isolated within the bone, trepanation alone will relieve. This condition being diagnosed, only one course is to be pursued—viz. laying open the mastoid antrum. In acute cases in previously healthy ears this must be done by traversing the mastoid from behind the ear, not by way of the tympanic cavity, as that implies destruction of healthy conductors of sound. The antrum being gained, the abscess is opened. Iodoform-tampon and dressing of the wound are to follow.

In mastoid abscess consequent upon chronic suppuration of the drum-

¹ *Annales des Mal. de l'Oreille*, Jan., 1895.

² *Arch. of Otol.*, April, 1895.

³ *Annales des Maladies de l'Oreille*, June, 1894; "Des Suppurations mastoïdiennes et de leur Traitement," Paris, Steinheil, 1894, 1 vol. 8vo, pp. 260. See also "Des Mastoïdites compliquant les Otites," Gerard Marchat, *Soc. de Chir.*, Dec. 26, 1894.

cavity the reporters, Lubet-Barbon and Martin, prefer approaching the antrum from the mastoid surface behind the ear, rather than by the method of Staacke, by way of the drum-cavity and the aditus. Staacke's method is objectionable, in their opinion, on account of the large destruction of tissue.

3. A mastoid abscess left to itself may discharge itself internally through the mastoid cortex, into the cranial cavity, into the lateral sinus, or it may empty into the sheath of the muscles that are inserted into the mastoid process. In the latter case it is necessary to make an opening in the lowest part of the abscess, follow backward the course of the pus to its source, and then trephine the mastoid at the suprameatal triangle of McEwen, a spot bounded by the lower posterior edge of the zygomatic root and the superior posterior edge of the external auditory canal. A tampon and dressing of iodoform-gauze are to follow.

Mastoid disease may extend outward by way of the "mastoid fissure, the continuation of the petrosquamous suture," as shown in a case reported by Moos.¹ Mastoid abscesses in children often pass outward in this way.² In this way probably a suppurative otitis media involving the mastoid cavity finally discharged itself beneath the soft tissues of the mastoid region behind the auricle, in a case reported by Fetterolf.³ An incision at this point by Dr. Seïss was followed by speedy cure. [We have seen and relieved 3 such cases since January 1st—1 following scarlatina in an infant two years old, 1 following influenza, and the third following an ordinary coryza.]

That Wilde's incision—*i. e.* an incision in the skin of the mastoid before supuration has occurred beneath it—is always useless and often harmful is shown by the French, notably by Chipault and Desmoulin.⁴ [An incision over the mastoid skin is not demanded, excepting to let out pus from beneath the integument or to prepare the way to open the bones to give vent to pus in the mastoid cavity. In the latter instance the Wilde incision is not the proper one. To make a Wilde incision to relieve pain in an ear already discharging is to open the way for infection of the soft tissues over the mastoid, and even of the bone in some instances, as shown in the article referred to. I have long ceased to make Wilde incisions for the foregoing reasons. The operation is indeed a remnant of the days of septic surgery.]

[“A Case of Acute Inflammation of the Middle Ear, terminating in Purulent Periphlebitis of the Lateral Sinus; Operation and Recovery,” reported by Buck,⁵ demonstrates the possibility that incisions and counter-irritation over the mastoid may lead to phlebitis in the mastoid emissary veins, and thence to periphlebitis of the lateral sinus. In fact, Wilde's incision simply for the relief of pain should be a thing of the past.]

¹ Archives of Otology, July, 1894.

² “Total Necrosis of Mastoid and Sequestra, reported by Kirchner.” The middle ear was not much affected (Archiv f. Ohrenh., Aug., 1894).

³ Polyclinic, Phila., June 1, 1895.

⁴ Ann. des Mal. de l'Oreille, tome xxi., April, 1895.

⁵ Med. Record, June 16, 1894.

[We cannot agree with Shimer¹ that mastoid disease of any form is a not uncommon "complication or sequel of gripe." Yet three cases of suppurative mastoiditis are reported by Filippi² in which influenza was supposed to play an etiological part. Intramastoid inflammation following an acute otitis media of any kind is among the rarest of diseases if the primary inflammation of the middle ear is not improperly treated. Unfortunately, cellulitis about the mastoid, which may occur in some cases of acute otitis media, is too often called mastoid disease and treated improperly by counter-irritation, which makes it worse, and then the hasty diagnostician resorts to trepanation, which may then lead to secondary septic infection with all its attendant evils. Redness and edema of the mastoid region, with tenderness on pressure and pains in it, in acute otitis media are generally indications of an improper treatment of the antecedent ear-disease, either by omission or commission, generally the latter. If perforation of the membrana has taken place spontaneously, and the surgeon refrains from meddling with syringing or putting anything in the ear, unless it be a drainage-strip of iodoform-gauze, healing will occur in a few weeks. If the spontaneous perforation is delayed, then paracentesis must be performed in twenty-four or forty-eight hours after the ear-pain has continued.] Jack³ reports 9 cases of mastoid disease and operations. Cozzolino⁴ reports 120 cases of mastoid disease; Grunert and Meier⁵ report 83 cases of mastoid operation—*i. e.* opening up the middle-ear cavities, and in some instances the adjacent structures—in which 7 deaths occurred. These fatal cases were the result of meningitis that existed before the trepanations.

Gomez⁶ has contributed an instructive article on the course and management of mastoid affections, setting forth especially the advantages of the Stacke-Schwartz operations.⁷

According to Broca,⁸ in cases of acute endomastoiditis following acute otitis media, as a rule only the mastoid cavity and not the attic requires opening. [We are surprised at the large number of acute cases in which he has thought opening the mastoid was really indicated—*viz.* in thirty. If the acute ear-disease is properly treated from the outset, mastoid disease is most unlikely to ensue. When it does, it is the result of irritation and secondary infection from improper treatment of the middle ear, which has caused not only retention of exudation, but also conveyed secondary infection to the already diseased ear. It does not appear from the notes of the acute cases in Broca's list that opening the mastoid cavity was really necessary in all of them. Light will be thrown on the true etiology of *acute* mastoiditis when

¹ University Med. Magazine, August, 1894.

² Annales des Mal. de l'Oreille, May, 1895, Morgagni, No. 7, 1894.

³ American Otological Society, 1894.

⁴ Rev. de Laryngol., etc., and Archiv f. Ohrenh., May, 1895.

⁵ Archiv f. Ohrenh., April, 1895.

⁶ New York Med. Jour., Sept. 1, 1894.

⁷ See also Maurel: "Trepanation de l'Apophyse mastoïde," Revue de Laryngol., etc., Jan., 1894; Archiv f. Ohrenh., May, 1895.

⁸ Annales des Mal. de l'Oreille, etc., Jan., 1895.

in the recording of such cases the treatment of the acutely inflamed ear, from the outset to the appearance of the mastoid symptoms, is at least carefully noted, even if it have not been properly carried out. Furthermore, we cannot admit that mastoid trepanation is demanded in cases of so-called painful eburnation of the mastoid. In fact, the very existence of such a disease is most doubtful. Neuralgia of the mastoid is doubtless often mis-called by this name of painful eburnating osteitis. It is not easy to see how eburnation can be diagnosticated in any event before the bone is cut into.]

Endomastoid abscess may not only extend to the upper posterior surface of the mastoid behind the auricle, but also down into the neck. The latter event is generally later than the first-named symptom, and is characterized by a tense, brawny swelling extending downward in the line of the sternocleidomastoid muscle and behind it toward the nucha, in most cases the pus following the plane of the deep fascia of the neck. It denotes a carious perforation in the medial wall of the mastoid process.¹ If the opening in the latter is in the extreme basal tip, the pus may go forward along the digastric groove into the retropharyngeal region as well as backward toward the nucha, as we have recently observed. Operation on the mastoid and in the direction of the burrowing pus-cavities is demanded. Knapp² reports the occurrence of an otitic retropharyngeal abscess, formed by the passage of pus from the drum-cavity along the semicircular for the tensor tympani muscle and the tissues about the Eustachian tube.

No mastoid operation is complete without cleaning out diseased tissue from the drum-cavity, even in those cases supposed (by general surgeons) to be primarily mastoid disease, or in which the disease is supposed to be chiefly, if not entirely, confined to the mastoid cavity.

Whenever a mastoid opening is to be followed by opening the cranial cavity and exposure of the dura, Zaufal³ always first opens the posterior fossa, and then, if this gives negative result, the middle fossa. If there has been a chill and the temperature is over 40° C., we are advised by him to lay open the transverse sinus. If clearing out the mastoid process leads down to the bottom of the sulcus, he opens the cranial cavity even if the bone is apparently healthy, provided, however, that the healthy blue sinus does not show through the tabula vitrea. If the pus in either acute or chronic mastoid empyema pulsates immediately after the trepanation, Zaufal holds that there is every probability that the pus-cavity communicates with the cranial cavity, and such communication must be most carefully sought for by a generous chiselling away of the bone.

In those cases of mastoid disease primarily due to chronic suppuration in the drum-cavity, if sclerosis of the bone is found, the upper posterior wall of the auditory canal must be removed in order to reach the antrum. In any case Zaufal aims for this, and also a wide exposure of the seat of disease in

¹ Jack: *Am. Otol. Soc.*, 1894; and Stout: *Polyclinic*, Phila., Feb. 6, 1895.

² *Arch. of Otol.*, April, 1895.

³ *Archiv f. Ohrenh.*, Dec., 1894.

the mastoid and antrum, in order to simplify and shorten after-treatment and thus effect a radical cure of chronic otitis media.

The surgeon cannot be too gentle or deliberate in operating on the mastoid, especially in children, as may be learned from a case reported by Ketch.¹ A boy, seven years old when first seen, was operated upon when twenty-one months old for a suppurative mastoiditis of the right side. The operation was immediately followed by a paralysis of the face and of the tongue. One year later the child began to have epileptic seizures for the first time in his life. He is intelligent, but the epileptic attacks still continue. At present he has the characteristic wrist-drop and posthemiplegic contraction of the Achilles tendon. Herzog² gives an account of a Stacke-mastoid operation followed by an epileptic attack, probably induced by the pressure of a too firm iodoform-tampon in the cavity of the middle ear.

Gentleness, complete antisepsis, and the absence of hurry in mastoid operations are characteristics of Schwartz, who has operated more frequently on the mastoid than any other living surgeon.³

We agree with Zaufal⁴ that a mastoid operation in most cases is preliminary to deeper cranial operations. [A cranial operation for the relief of an intracranial lesion of otitic origin is useless, however, without a complete removal of the source of the infection in the tympanum by laying open all the cavities of the middle ear and freeing them of septic matter.]

Trepanation of the petrous bone in a line with the upper posterior wall of the bony auditory canal has been performed by Le Riche⁵ for the extraction of a pistol-ball, found at last impacted near the tegmen tympani and removed. A scale of bone, 10 mm. by 15 mm., forced into the brain-substance above the tegmen, was also removed. Under antiseptic dressings the patient, a would-be suicide, entirely recovered, and has remained well for two years.

Basal fracture of the skull involving "the apex of the petrous part of the temporal bone" may produce paralysis of the fifth, sixth, and seventh nerves, as in a case reported by Dunn.⁶

CHOLESTEATOMA OF THE EAR.

Baginsky⁷ gives a sketch of the various views of the nature of cholesteatomata of the ear, favoring Virchow's view that they are true heteroplastic tumors, with possibly here and there cases in which cholesteatomatous masses are thrown off which are not from a truly heteroplastic (encapsulated) source. Milligan⁸ describes two cases of cholesteatoma, one in the attic, the other in the mastoid antrum. The first case, in a man of fifty-six, was cured by scraping with small Volkmann spoons through the external auditory canal; the second, in a boy of fifteen, was cured by opening the mastoid and removing

¹ Medico-Surgical Bulletin, May 15, 1894.

² Arch. of Otol., April, 1895.

³ See Richards, Boston Med. and Surg. Jour., March 21, 1895.

⁴ Archiv f. Ohrenh., Dec., 1894.

⁵ Jour. de Méd. de Paris, March 10, 1895.

⁶ Arch. of Otol., July, 1894.

⁷ Berlin. klin. Wochenschr., June 25 and July 2, 1894, translation in Annals of Oph. and Otol., Jan., 1895.

⁸ Liverpool Medico-Chirurgical Journal, July, 1894.

the large white tumor by forceps. Lichtwitz and Sabraes of Bordeaux¹ report a case of cholesteatoma of the ear in a man twenty years old, who had suffered until six years previous with chronic otorrhea. Great relief to sensation of fulness in head and deafness followed removal of the mass. Cholesteatoma may be latent for a long time. Perhaps in such cases the tumor is primary.² Schwartze³ maintains that cholesteatoma can be permanently relieved only by the formation of a broad fistula behind the ear. Reinhard, too, is in favor of a permanent opening behind the auricle. In 19 cases of cholesteatoma, 15 thus treated recovered, whereas in the other 4, as soon as the wound closed new pathogenic membranes formed, broke down, and the lives of the patients were threatened by the renewed growth of cholesteatoma in the middle ear. Caries is usually present with cholesteatoma. Politzer does not think that the permanent opening behind the ear can prevent the regrowth of cholesteatoma in those parts of the middle ear not visible even through the artificial permanent opening.

Grant⁴ thinks that recurrences may ensue even in the skin which has been transplanted to the old cavity affected once with cholesteatoma.

Vulpis⁵ says that cholesteatoma of the ear-cavities occurs much more frequently in Germany than in the United States. He believes it neither desirable nor necessary for a cure in cholesteatoma in any case to retain an opening behind the auricle. Certainly nature never indicates such a procedure. Reinhard⁶ has found that if after mastoid trepanation for the removal of cholesteatoma of the antrum a retroauricular opening is maintained by implantation of the integument of the mastoid, no return of the disease will ensue. If the opening is not thus maintained, the tumor will grow again and endanger the life of the patient. Bezold claims great advantage from epidermic transplantations in cholesteatomatous cavities (Thiersch). This leads to healing in from four to six weeks; otherwise many months may be required for healing. Transplantation brings about the result of lining the previously suppurating cavities with a dry membrane, without the permanent opening behind the auricle. Reinhard⁷ earnestly advocates treating cholesteatoma of the temporal bone by maintaining a persistent opening behind the auricle after the Schwartze-Stacke operation. [We, however, agree with Hansberg and Voltenino that this permanent opening is usually unnecessary.]

OTITIC BRAIN-ABSCESS.

[Symptoms of otitic brain-abscess (in the temporal lobe), in the advanced stage, are great sopor, inability to speak and swallow, groaning, as in meningitis, and complete motor and sensory paralysis of the opposite side, the abscess generally being on the side of the diseased ear. This paralysis may

¹ Bulletin médical, No. 25, 1894.

² Grunert and Meier: Archiv f. Ohrenh., April, 1895.

³ Archiv f. Ohrenh., April, 1895.

⁴ Ibid., Aug., 1894.

⁵ Ibid., April, 1895.

⁶ Ibid., Aug., 1894.

⁷ German Otol. Congress at Bonn, 1894. See N. Am. Pract., Dec., 1894; also Arch. of Otol., April, 1895.

extend to the opposite arm, leg, and facial nerve, chiefly of the lower branches. Convergent strabismus during sleep, disappearing on awakening, inequality of the pupils, the wider being on the unaffected side, and optic neuritis on the affected side, may also be present. The great distinguishing features are, however, subnormal temperature and pulse. Movement of the head and pressure on the nucha are often very painful. There may be hemianesthesia on the opposite side. There is generally absence of vomiting, convulsions, fever, and chills in uncomplicated otitic brain-abscess. The paralytic symptoms, as given, generally indicate pressure from the abscess of the temporal lobe upon the internal capsule.

The great majority of cerebral abscesses occur in the temporal lobes, the fewest in the occipital lobes.] According to Koerner,¹ in 100 cases abscess was found 62 times in the cerebrum, 32 times in the cerebellum, and 6 times in both. The diagnosis of the presence of a cerebral abscess is not extremely difficult, but the physician may for a long time be unable to locate it. Focal symptoms finally determine the latter. The symptoms of abscess in the temporal lobe are often too slight at first to be characteristic, because at the outset a temporal-lobe abscess is situated in the white substance of the brain. Disturbances of speech have been observed in abscess in the left temporal lobe; amnesic aphasia also may be noted.² Abscess in the temporal lobe may by inward extension press on the lenticular nucleus, or, deeper, upon the internal capsule, producing motility-disturbances on the opposite side, as in a case reported by Burnett and Willard.³ Bilateral abscess of the brain has been noted by Koerner and Jansen,⁴ as stated by Schubert; and also by Moos.⁵ Hemipopia may be observed in abscess of the temporal lobe. The rule is that an otitic cerebral abscess is in the temporal lobe near the petrous bone. When it is developed far away from the petrous bone, it is in connection with acute otitides: these Hansberg terms "atypical." Abscesses in the cerebellum are still more difficult to diagnose, and their localization is almost impossible from focal symptoms.⁶ Bilateral choked disk, from pressure upon the transverse and cavernous sinuses and the ophthalmic veins, is the only sure sign. Unilateral choked disk, if it occurs, is a sign of abscess in the temporal lobe. The localization of a cerebral abscess may be aided by the detection of homonymous hemianopsia in connection with loss of memory for names, as in a successful case reported by Knapp.⁷ The hemianopsia showed a brain-disease situated between the left cuneus and the optic chiasm. The loss of memory pointed to disturbance in the memory-center, the temporosphenoidal lobe, and here the abscess was found at the first plunge of the aspirator.

Abscess of the left occipital lobe may cause object-blindness, word-blind-

¹ Die otitischen Erkrankungen des Hirns, der Hirnhäute und der Blutleiter, Frankfurt O. M., 1 vol., J. Alt, 1894.

² Hansberg: Arch. of Otol., Jan., 1895.

³ Arch. of Oph. and Otol., April, 1894.

⁴ Monatssch. f. Ohrenh., Nov., 1894.

⁵ Zeitschr. f. Ohrenh., Bd. xxv., 1894.

⁶ A similar opinion is expressed by Dr. J. G. Risler of Stockholm: Journal of Nervous and Mental Diseases, Aug., 1894; rev. of F. H. P.

⁷ Arch. of Otol., July, 1894.

ness, paralexia, paraphasia, but no word-deafness, as in a case reported by Campbell.¹ At times there were aphasia and loss of power in the right arm and leg, which later were convulsed in the aphasic seizures. Marked double optic neuritis and homonymous hemianopsia were also detected. This man of forty-three had had chronic otorrhea on the left side for ten years.

Randall² reports a case of otitic brain-abscess at the base of the brain and about the medulla that proved fatal by causing meningitis, most probably by rupture. Two cases of otitic brain-disease, sinus-thrombosis, and abscess are reported by Moss.³ The first case proved to be a suppurative of the mastoid with perforation of its tip and burrowing of pus beneath the fascia of the neck, and diffuse cellulitis from mastoid to clavicle, following acute otitis from measles in a woman of twenty-seven. Mastoid operation gave only temporary relief (three weeks). Symptoms of sinus-thrombosis then set in, and ligation and excision of the jugular between the ligatures gave entire relief. In the second case, in a woman of fifty-one, there was a history of acute otitis a year previous. When first seen by Dr. Moss she complained of much pain in the occiput and mastoid. Paracentesis of the membrana and dry heat gave only short relief. Ten days later the mastoid was opened and the antrum cleared of a little cheesy pus. Then gradually subnormal pulse and temperature set in, and an operation for relief of cerebral abscess was undertaken, and the sigmoid and lateral sinuses were exposed; but no abscess was found. The patient lingered twenty-four days, and then with sudden symptoms of meningitis (due probably to rupture of an undiscovered abscess) she died. There was no postmortem.

Brain-tumor complicated with purulent otitis media and mistaken for brain-abscess has been reported by Schwartz.⁴ Such an affection is a great rarity. It was observed in a boy of twelve. Moos⁵ records a case of a man of twenty-one who after exposure to cold began in a month to show unsteadiness in gait, and in two months profound deafness in the left ear. The cerebellar ataxia, the paresis of the left facial and abducens, the participation of the left trigeminus and the acoustic, and the slight weakness and increase of tendon-reflexes on the left side observed in this case led to the diagnosis of "an affection of the cerebellum and medulla, probably a tumor (glioma)." The autopsy revealed a tumor involving the left crus of the pons and the outer part of the left half of the pons, and the adjoining region of the crura of the cerebrum. There was "entire disappearance of the nuclei and root-fibers of the abducens, facial, and auditory of the left side."

Other typical cases of otitic brain-abscess have been reported by Coe,⁶ Hansberg,⁷ Pollak,⁸ Brieger,⁹ and Knapp.¹⁰

¹ Liverpool Med.-Chirurg. Jour., Jan., 1895.

² University Med. Magazine, Phila., June, 1894.

⁴ Archiv f. Ohrenh., April, 1895.

⁶ Medical Sentinel, Nov., 1894.

⁸ Wiener med. Wochenschrift, Dec. 2, 1894.

⁹ Otol. Section, Meeting of German Naturalists, Sept., 1894.

³ Arch. of Otol., Jan., 1895.

⁵ Archives of Otol., July, 1894.

⁷ Arch. of Otol., Jan., 1895.

¹⁰ Arch. of Otol., May, 1895.

Moure¹ reports "A Case of Unrecognized Abscess of the Brain following Purulent Otitis." It is here shown that characteristic symptoms may be absent. Moos² reported the observation of two abscesses on the same side of the brain. Gellé³ reports a case with symptoms of typhoid only. Cozzolino⁴ and Poli⁵ each reports a case with apoplectic symptoms. Politzer⁶ calls attention to rupture of the abscess into the ventricles in some cases.

Heaton⁷ has observed and recorded a case of chronic purulent otitis media in which an intracranial abscess, accompanied by subnormal pulse and temperature, finally discharged into the tympanum after the antrum was exposed and the carious tegmen tympani was scraped. The patient, a boy of twelve, the subject of chronic otorrhea for nine years, entirely recovered. This abscess was of course near if not within the temporal lobe. Brieger⁸ reports having observed 2 instances of spontaneous evacuation of cerebral abscess; 1 died finally of sinus-thrombosis, and the other permanently recovered. Gruber⁹ also reported a case of spontaneous evacuation of an otitic cerebral abscess through the external auditory canal.

Spontaneous healing of an otitic cerebral abscess, proved later by post-mortem examination, has been observed by Brieger, Reinhard, Roller, and Urbantschitsch.¹⁰

Treatment of Otitic Cerebral Abscess.—From Hansberg's¹¹ article we learn that otitic cerebral abscess was relieved by trephining (following up a fistula in the bone) as early as 1751 by Moraud, and again in a similar case by Le Roux in 1844. Shede, however, in 1886, was the first to trephine the intact cranial bones for the relief of otitic cerebral abscess.

[The first step in the operation for relief of an otitic brain-abscess must be a thorough opening up of the middle-ear cavities by mastoid operation according to the methods of Stacke, Schwartze, or Zaufal, or a combination of them all. If this is not done, and the patient is relieved of only the brain-abscess by cranial trepanation, he recovers from the latter to run the chance of suffering from another intracranial lesion from the still septic nidus in the middle-ear cavities. As the aurist is generally the best prepared to perform the tympanomastoid operation, an operation more difficult than cranial trepanation and opening of a cerebral abscess, the aural surgeon should perform the cranial operation in otitic-cranial disease. Or he may do the tympanomastoid part of the operation, without which the cranial operation may be, at best, of only temporary benefit, and call upon a general surgeon to do the rest of the work if he and the general surgeon can so arrange it. Or, if the general surgeon performs the cranial trepanation for relief of otitic brain-abscess or sinus-thrombosis, the patient, if saved by the operation from

¹ Archiv f. Ohrenh., Aug., 1894.

² Ibid.

³ Ibid.

⁴ Ibid.

⁵ Ibid.

⁶ Ibid.

⁷ Provincial Med. Jour., June 1, 1894.

⁸ Archiv f. Ohrenh., April, 1895.

⁹ Ibid.

¹⁰ Ibid.; see also Joel of Gotha: "Contributions to Brain Surgery in Ear Cases," XI. Internat. Med. Cong., 1894.

¹¹ Arch. of Otol., Jan., 1895.

immediate death, should undergo as soon as possible the tympanomastoid operation for permanent cure of the chronic purulency of the middle ear. Otherwise he may be rescued from the first peril only to incur the risk of another intracranial lesion of otitic origin. This is insisted upon by Pritchard,¹ Risler,² and others. In Europe aural surgeons are now performing cranial operations in conjunction with the tympanomastoid operations for relief in otitic intracranial lesions, with the greatest success, because they can best perform the tympanic and mastoid operations (Schwartz, Grunert, Meier). In America, Knapp has performed the tympanomastoid-cranial operation for relief of otitic brain-abscess.]³

Grunert and Meier⁴ disapprove of the endeavor to expose an abscess in the temporal lobe by going through the tegmen tympani in preference to the usual method of trephining through the squama, unless there is already a fistulous opening in the tegmen leading to the cranial cavity. After an abscess in the temporal lobe is opened by trepanation through the squama a counter-opening may be made through the tegmen tympani, if such is demanded by the position of the abscess, and a more efficient drainage secured than already afforded by the opening in the squama.

In cases of otitic abscess of the brain and in otitic meningitides Broca⁵ advises thorough and generous exploratory trepanation of the cranium, if such seems necessary, after first thoroughly exposing the middle-ear cavities. Abscesses formed at a distance from these centers of osseous caries are always preceded by lesions of the dura near these centers. Hence his preliminary exposure of the middle-ear cavities in order to gain an idea of the direction in which to explore the cranial cavity.

Knapp⁶ reports a case of abscess of the brain resulting from chronic suppurative otitis that invaded the mastoid, the cranium, and the scalp. He performed two operations—the first, trepanation of the mastoid and the cranium, with incision of the dura mater and puncture of the abscess of the brain. The second operation was incision of a fresh abscess which formed in the cerebral hernia subsequent to the trepanation.

When hernia cerebri ensues after trephining for relief of cerebral abscess from otitic disease, it seems well to let the hernia alone until the healing of the abscess-cavity or cavities in the brain within the cranium, when by contraction of the cicatrized tissue the hernial protrusion is drawn back into place, as shown in a case reported by Knapp.⁷ Many surgeons, however, recommend cutting off the protruding brain-substance. Ashhurst⁸ reports having “operated unsuccessfully upon three patients for the cerebral complications resulting from diseases of the middle ear. Statistics show that many lives have been saved by trephining under these circumstances, but in

¹ Arch. of Otol., Jan., 1895.

² Jour. Nerv. and Ment. Dis., Aug., 1894.

³ Arch. of Otol., July, 1894, and April, 1895.

⁴ Archiv f. Ohrenh., April, 1895.

⁵ Bulletin de la Société anatomique de Paris, July, 1894.

⁶ American Otological Society, May, 1894.

⁷ Archives of Otology, July, 1894.

⁸ Phila. Polyclinic, June 29, 1895.

my own cases, though the abscesses have been reached and evacuated, the patients have died." [We are not informed whether in the three cases named the middle-ear cavities were exposed and the purulent nidus cleaned out. It does not seem that the otitic brain-abscess is really "reached and evacuated" until the original source of the infection of the brain-tissue, the purulent middle ear, and possibly mastoid antrum, are reached and evacuated of all infective matter. Failure to do this may explain the want of success in some cases of operation for relief of otitic brain-abscess at the time of trephining the cranium.]

Cerebellar Abscess.—Heiman of Warsaw reports a case of "latent cerebellar abscess" occurring in a soldier of twenty-four, affected with chronic otorrhea of the left side, the same side as the abscess. There were no characteristic symptoms of cerebellar abscess in this case. The discharge from the ear had been temporarily checked by the use of perchlorid of iron [a too powerful astringent for otitis, and likely to favor septic retention and secondary infection of cranial cavity] twice a week for a month. Suddenly the patient was attacked with violent earache, headache, and fever, but no other nervous phenomena. Headache increased, but consciousness was retained until near death, which occurred in less than twenty-four hours after the beginning of the headache and earache. Postmortem examination showed a ruptured cerebellar abscess in the processus vermicularis.

Drummond¹ has reported the case of a girl of nine, who for three years had had a purulent discharge from the right ear, with the development, a few days before coming under observation, of headache, vomiting, paralysis of the right arm, and right-sided convulsions. The child lay in bed on the left side. The right arm was helplessly paralyzed, the right angle of the mouth was weak, and the leg on the same side showed evidence of paralysis, although a certain degree of voluntary power remained. Convulsions recurred at intervals of an hour, and sometimes more frequently. The spasm began in the face, and almost immediately extended to the arm, and occasionally to the leg, but remained limited to the right side. In the intervals the child seemed to regain consciousness, and then it was observed that she was unable to utter a syllable, although to a certain extent she understood spoken language. There was early optic neuritis. No obvious discharge was to be detected from either ear, though cotton introduced in the right meatus was soon moistened with offensive purulent material, and also a perforation of the left tympanic membrane was discovered, with some fetid discharge. It was decided to explore the temporosphenoidal lobe on the left side, but an abscess was not found. The left arm-center was then exposed, and also the left lobe of the cerebellum, but without disclosing a purulent focus. For a few days succeeding the operation the patient seemed to be somewhat better, the fits becoming less numerous and consciousness returning, but the arm remained paralyzed and the speech-defect was unaltered. Death took place a week later, and on postmortem examination a

¹ *Lancet*, No. 3700, p. 190, July 28, 1894.

large abscess-cavity, containing about an ounce of pus, was found in the right lobe of the cerebellum, located near the surface and about three-quarters of an inch from the medulla. Careful exploration failed to disclose a lesion of the left side of the brain.

A case of cerebellar abscess, sinus-phlebitis, and suppurative otitis media is reported by Morris.¹ The patient was a man of twenty-seven. The purulent ear-disease in this case seems to have been acute. The low temperature and subnormal pulse led to diagnosis of brain-abscess, but precise localization was impossible. Postmortem examination revealed an abscess in the cerebellum on the same side as the purulent ear. Winter and Deanesley² report a successful operation by Dean's method of exposure of the lateral sinus for relief of an otitic cerebellar abscess in a boy sixteen years old. Harrison³ reports an unsuccessful operation in a case of cerebellar abscess of otitic origin in a young man.

OTITIC SINUS-THROMBOSIS AND PYEMIA.

Crockett⁴ reports a case of thrombosis of the lateral sinus from chronic purulent otitis successfully operated upon. He very justly concludes that "the symptoms of many cases of lateral sinus-disease are merely high temperature, general malaise, or exhaustion and moderate pains; one may also have cellulitis of the neck, tenderness or pain in the neck, or torticollis, but repeated chills, nausea and vomiting, delirium, convulsions, optic neuritis, diarrhea, etc., symptoms commonly ascribed to thrombosis of the sinus, are rather signs of the complications of thrombosis of the sinus, such as systemic septic infection, meningitis or brain-abscess, or septic pneumonia, and their presence in any given case should make the prognosis of the operation much more guarded than where we have merely the first group of symptoms."

He "attributes the success of the operation in the case referred to to the fact that it was done early in the course of the disease, before the clot had time to become purulent, or emboli to form, or the system to become thoroughly poisoned with the septic contents of the vein, believing that, in view of the high mortality of this disease, it is far better to perform an exploratory operation under antiseptic precautions than to run the risk of overlooking this most serious complication of suppuration of the middle ear."

Comparatively slight symptoms of sinus-phlebitis were noted at first in a case⁵ of right otitis media of six months' duration in a boy of six; at last the symptoms were pyemic. At the postmortem examination there was found extensive sinus-thrombosis, beginning in the right petrosquamous sinus,⁶ and extending into the right lateral sinus, and thence both into the jugular of that side and, posteriorly, around into the left lateral sinus. The point of origin of the thrombus in the petrosquamous sinus is believed to be unique.

¹ Medical News, Oct. 6, 1894.

² Lancet, Dec. 8, 1894.

³ Ibid., July, 1894.

⁴ American Otological Society, 1894.

⁵ Cleveland: Arch. of Otol., April, 1895.

⁶ See Quain's Anatomy, 1892, vol. ii., part 2, p. 524.

There was necrosis at its anterior part where pus had entered. There was also found a cerebellar abscess on the *left* side. Simple mastoid trepanation in this instance of course proved of no avail. The normal hearing in this case was explained by the intact ossicula, the carious disease in the tympanum having attacked the region named above.

Moos¹ records a cerebellar abscess as occurring on the side opposite to the diseased ear, with an abscess in the cerebrum in the same brain on the side of the diseased ear.

Koerner gives credit to Zaufal for first suggesting (1880) the ligation of the internal jugular for the prevention of septic embolism of the heart from the matter derived from phlebitis of the lateral sinus, and to Lane for putting it first in practice. He records 20 cases—13 cures and 7 deaths. In 55 cases of cerebral abscess operated upon, 29 were cured and 26 deaths occurred. Abscess of the cerebellum offers a grave prognosis.²

Moos³ further records 2 fatal cases of otitic intracranial complications—1 sinus-thrombosis, and 1 cholesteatoma, meningitis, and sinus-thrombosis.

Otitic Pyemia.—Otitic pyemia may be the result of either an acute or a chronic inflammation in the middle ear. In the former instance there generally first occurs an osteophlebitis about the middle ear, followed by abscesses in the muscles and joints of the body. In the latter instance, in chronic otitis, there is usually a sinus-phlebitis with resultant embolic abscesses in the lung, liver, spleen, and kidneys. In 9 cases of otitic pyemia recorded by Hessler⁴ 6 recovered, 4 with and 2 without mastoid operation. Kirehner⁵ reports a number of cases of otitis media acuta in influenza, complicated by sudden sinus-thrombosis without previous symptoms of retention of pus. He advises very prompt and generous paracentesis as the means of preventing the passage of infective matter inward through the lymphatics and blood-vessels. Deanesley⁶ gives an account of a case of "aural pyemia without sinus-thrombosis treated by ligature of the internal jugular vein and plugging of the lateral sinus," occurring in a child of four after scarlatina. Both ears were profoundly affected, but only the left was operated upon by opening the mastoid and antrum. As this ear appeared most diseased, the left internal jugular vein was ligatured; but death occurred from exhaustion thirteen days after the ligation of the vein. It appeared that general purulent absorption had occurred from both ears in this case. Schwabach⁷ also describes a case of otitic pyemia without phlebitis of the transverse sinus, though there was tenderness along the line of the jugular vein. Cholesteatoma of the tympanum in this case penetrated the middle cerebral fossa, causing fatal meningitis.

The possible conveyance of otitic suppurations into the cranial cavity by the way of the carotid canal is shown by Meier⁸ in notes of 3 cases. Pus

¹ Zeitschr. f. Ohrenh., Bd. xxv., 1894.

² Zeitschr. f. Ohrenh., July, 1894.

³ Ibid., April, 1895.

⁴ Deutsche med. Woch., Mar. 15, 1894.

⁵ Annales des Mal. de l'Oreille, Sept., 1894.

⁶ Archiv f. Ohrenh., Dec., 1894.

⁷ Brit. Med. Jour., April 13, 1895.

⁸ Archiv f. Ohrenh., April, 1895.

is conveyed in such cases through the anterior tympanicocarotid wall into the veins and lymphatics surrounding the carotid artery, forming a "carotid sinus," and thence into the cranial cavity. There is nothing characteristic in these cases, according to Meier, and yet it is worthy of note that in two of the cases reported swelling of the eyelids and prominence of the eyeballs on the side of the diseased ear were noted, and in all of them the cavernous sinus was found diseased. Death occurred in all from meningitis diffusa. Meier claims that this is the first instance in literature in which the post-mortem examination demonstrated that the cavernous thrombosis had its origin in the thrombus of the carotid venous plexus, due to infection from tympanic suppuration. The lymphatics are the way of pyemic infection ex otitide, without sinus-phlebitis, and not osteophlebitis. These constitute the so-called spontaneous cures of the supposed sinus-thrombosis.¹ A case of double mastoid empyema with septic thrombosis of the lateral sinus on the left side, with operation on both mastoid antra (Stacke) and removal of the suppurating clot from the sigmoid sinus, is reported by Walker.²

Milligan³ has contributed a valuable paper on thrombosis of the intracranial sinuses secondary to suppurative disease of the middle ear. Two cases are reported—one due to chronic, the other to acute, suppuration in the ear. In the first the internal jugular was ligated, and then the sigmoid sinus opened and cleansed through the jugular vein at the opening in the neck. Then the mastoid antrum and middle ear were cleaned out. Prompt recovery ensued. In the second case the mastoid operation was performed first, for the relief of the then prominent symptoms of mastoid empyema. In a day or two symptoms of sinus-thrombosis set in, but the parents of the child refused to have an operation performed on the sinus. The temperature reached 105°. Numerous rigors, followed by high temperatures, were experienced for two days, when the patient complained of pain in her right eye, the side of the affected ear. The eyelid began to swell and the eyeball to protrude. Optic neuritis was now marked, and excruciating pain was complained of behind the eye. The eyeball was finally excised by Gillibrand, and the socket was found full of foul pus. Thrombosis of the cavernous and ophthalmic veins had evidently existed, ending in suppuration as above stated. The child now recovered rapidly. Perhaps this lesion originated in a thrombus of the carotid venous plexus, like Meier's case referred to above. Edema of the eyelid and of the face on the side of the affected ear has been noted by Mussat⁴ also in a fatal case of thrombosis of the left lateral sinus. Milligan urges prompt operation in cases of sinus-thrombosis before these symptoms are masked by the other graver ones, thus agreeing with Green and Crockett (p. 871).

A successful case of operation for relief of sinus-phlebitis is reported by Schubert. The same author⁵ describes a case of otitic pyemia without sinus-

¹ Grunert and Meier : *Archiv f. Ohrenh.*, Apr., 1895. ² *Brit. Med. Jour.*, Apr. 13, 1895.

³ *Ibid.*, Apr. 20, 1895.

⁴ *Ann. des Mal. de l'Oreille*, May, 1895.

⁵ *Monatsschr. f. Ohrenh.*, Nov., 1894.

phlebitis. The patient recovered without operation, because the mastoid and sinus were not involved.

Jack¹ reports a case in which it was necessary to open the lateral sinus. This occurred in a case of chronic otorrhea in a man. Septic symptoms were relieved by a mastoid opening. Then septicemic symptoms ensued and opening of the sinus became necessary. Symptoms continued for four weeks, when death occurred.

Wilson reports 5 deaths following suppurative otitis.² Sinus-thrombosis and septicemia caused death in 4 instances, and leptomeningitis in 1.

We entirely agree with Dr. Wilson in his conclusions that the removal of one or more ossicles for the cure of obstinate otorrhea, even if it destroys hearing, may save life (by effecting drainage and preventing intracranial and general infection); and that the absence of mastoid tenderness, redness, and swelling should not deter the surgeon, in the presence of symptoms of constitutional infection, from prompt exploration of the temporal bone.

Schiffers³ reports the case of a man of twenty-two in whom there existed chronic purulent otitis media for many years with no treatment. At last he was suddenly attacked with symptoms of phlebitis of the left cavernous sinus. In five months recovery ensued, and he left the hospital. A few months later symptoms of purulent meningitis set in, and the man died in four days.

Koerner⁴ shows that postmortem examination of tuberculous patients often reveals, among other lesions, tuberculous disease of the meninges and brain in conjunction with similar lesions of the temporal bone. In such cases it is not easy to locate the primary lesion.⁵

Clark⁶ has given a postmortem demonstration of a case of pyemia following a case of latent otitis media. [There must have been a time in the history of the case when a competent medical man could have detected the ear-disease (the origin of the fatal pyemia, finally) and have cured it. The symptoms were at last typical of advanced otitic sinus-thrombosis and pyemia. Even at this late date, if the patient had been questioned as to his ear, he in all probability would have stated that at some time in the near past it had pained him.]⁷

¹ Am. Otol. Soc., 1894.

² Ibid.

³ Ann. des Mal. de l'Oreille, Aug., 1894.

⁴ Ann. of Oph. and Otol., Jan., 1895.

⁵ Guye reports a case of pachymeningitis externa ex otitide cured by trepanation (XI. Internat. Med. Congress, 1894; also Arch. of Otol., April, 1895); Jansen, one of circumscribed brain-tuberculosis, diffuse tuberculous arachnitis in connection with perforative pachymeningitis in cholesteatoma of the ear (XI. Internat. Med. Congress, 1894); also a case of healed circumscribed purulent pachyleptomeningitis on the under surface of the left temporal lobe (ibid.); Macewen, one of pyogenic infective diseases of the brain and spinal cord (Meningitis, Abscess of the Brain, and Sinus-thrombosis, J. Modehouse and Sons, Glasgow, 1893); Krepuska, one of symptoms of brain-pressure in a case of chronic purulent otitis media, with a mastoid operation: exposure of the transverse sinus, followed by cure (Hungarian Otology Soc., Budapest, 1894; Archiv f. Ohrenh., May, 1895).

⁶ Med. News, Jan. 5, 1895.

⁷ See also papers by Moos, "Ueber Otitische Lateral-sinus-thrombose," Archiv f. Ohrenh., August, 1894; Reinhard: "A Case of Otitic Sinus-phlebitis and Pyemia;" Jansen: "Expe-

Knapp¹ reports a fatal case of purulent leptomeningitis of the convexity of the anterior lobes, of chronic otitic origin. Mastoid and then cranial trepanation were without benefit. This case was complicated by an otitic retropharyngeal abscess, which caused the patient to complain of the sensation of a foreign body in his throat, made swallowing difficult, and occasioned copious secretion and constant spitting. [The same symptoms were noted by myself in a case of otitic retropharyngeal abscess (see p. 863) successfully relieved by operation in March, 1895. Copious secretion and constant spitting are tabulated by Allen² as characteristic of retropharyngeal abscess as well as of foreign bodies in the esophagus.]

Vulpus³ reports 3 cases of otitic epidural abscesses relieved by trepanation of both inner and outer mastoid tables.

NECROSIS AND SEQUESTRA OF THE LABYRINTH.

M. Lannois⁴ has observed 3 cases of necrosis and sequestra of the labyrinth, the *first* case in a man of twenty-three, affected with chronic otorrhea for twenty years. An acute attack of pain with pyemic symptoms was followed by relief from the acute symptoms, but a continuation of more or less chronic discharge. In six months the patient removed from his ear a sequestrum which proved to be the entire cochlea. Then all discharge from the ear ceased. There was some hearing for the watch and Politzer's acoumeter on contact; Rinne's test was negative; there were no vertiginous symptoms at any time.

The *second* case was that of a man of sixty-eight who had never had any discharge from the ear until within three months of the time he was first seen by Lannois. At the end of these three months the patient felt severe pains in the ear and suffered from loss of sleep and vertigo. After suffering in this way for a month he perceived a hard substance in the auditory meatus. This proved to be a small portion of the promontory and a fragment of the first whorl of the cochlea. After the removal the patient recovered speedily, but the deafness remained profound. [The advanced age of the patient and the rapidity of the necrosis are worthy of note, as usually such phenomena appear in the young after a prolonged chronic otitis media.] There was no facial paralysis in this nor in the first case, because *only* the *cochlea* was attacked.

In the *third* case, however, in a young girl of fifteen affected with hereditary tertiary syphilis, there was chronic otorrhea and facial paralysis. Several sequestra were detected in the auditory canal, and to remove the largest the auricle had to be detached. Then this large sequestrum was found to consist of the entire pyramid of the petrous bone. No trace of a labyrinth.

riences with Sinus-thrombosis in the Year 1893, in Prof. Lucae's Clinic" (XI. Internat. Med. Cong., 1894); Kirchner: "Thrombosis of the Cavernous Sinus in Acute Otitis Media" (ibid.).

¹ Arch. of Otol., April, 1895.

² Amer. Laryngol. Soc., 1895.

³ Arch. of Otol., April, 1895.

⁴ Ann. des Mal. de l'Oreille, June, 1894.

Goldstein¹ reports a case of exfoliation of the cochlea, vestibule, and semicircular canals; and Friedenwald reports a case of "spontaneous elimination" of a portion of the labyrinth (semicircular canal) after Küster's operation on the mastoid. Kirchner,² too, has reported a case of necrosis of the entire cochlea.

¹ Annals of Oph. and Otol., April, 1895.

² Archiv f. Ohrenh., Oct., 1894.

DISEASES OF THE NOSE AND LARYNX.

THE NOSE AND ITS ACCESSORY CAVITIES, THE NASOPHARYNX,
TONSILS, MOUTH, TONGUE, THYROID GLAND, AND LARYNX,
—WITH A REPORT UPON INTUBATION.

BY E. FLETCHER INGALS, M. D.,
AND
T. MELVILLE HARDIE, B. A., M. B.,
OF CHICAGO.

THE NOSE.

Anatomy.—Hoffmann¹ disproves Zuckerkandl's statement to the effect that asymmetry of the choanæ is infrequent and of little importance. He further finds the choanæ in men average 20 mm. high and 10 mm. wide, instead of 23 mm. and 11 mm., according to Zuckerkandl. He finds it possible to make exact casts of the parts as follows: On a special holder he carries behind the cocaineized soft palate, which has been tied forward by a rubber tube passed through the nose and mouth, a ball of "Stent's mass" (used for making dental impressions) which has been softened in hot water. This is held in place for four minutes, when the impression is sufficiently fixed. From this a plaster cast is made. Martin² discusses the various theories that obtain concerning deflections of the septum, and believes them to be due rather to the blending of different racial types than to evolutionary and devolutionary changes from a prognathous to an orthognathous type. Lavraud³ discusses the mechanic causes that produce deformities of the face and obstruction of the upper air-passages. Freeman⁴ would substitute the name quadrangular for the cartilage of the septum, commonly known as the triangular cartilage. Allen⁵ demonstrates the effects of cretinism on the shape of the nasal chambers. Baumgarten⁶ describes a case of double nose with two cartilaginous septa and three nares.

Physiology.—Scheff⁷ finds as the result of experiments that the greater part of the air-current passes through the middle meatus. J. Wright⁸ discusses the vascular mechanism of the nasal mucous membrane and its relations to certain pathologic processes. In chronic rhinitis the walls of the

¹ Deutsch. med. Woch., Dec. 20, 1894.

² Jour. Am. Med. Assoc., Sept. 29, 1895.

³ Rev. de Laryngol., 1894, xv.; Am. Med.-Surg. Bull., Mar. 1, 1895.

⁴ Univ. Med. Mag., Feb., 1895.

⁵ N. Y. Med. Jour., Feb. 2, 1895.

⁶ Am. Jour. Med. Sci., May, 1894.

⁷ Monats. f. Ohrenheilk., Oct., 1894.

⁸ Am. Med.-Surg. Bull., May 15, 1894; ref. Jour. of Laryngol., 1894, p. 751.

venous sinuses are much thickened by the overgrowth of nonelastic fibrous tissue of a low grade of development. This interferes with the contraction of the muscular fibers. In hypertrophy there exists not only a dilatation of the lacunæ, but a paresis of their walls. Atrophy has as its antecedents the gradual elimination of the muscular element and the encroachment upon the vascular spaces by this fibrous hyperplasia, which itself finally becomes to some extent absorbed, leaving as a thin covering to the turbinated bones a membrane deprived of glands and venous sinuses.

Nasal Septum.—For spurs Moure¹ recommends electrolysis, which is rapid, one application being sufficient, not very painful, and causes very little hemorrhage. The technique is as follows: "Each needle is covered with a hardened caoutchouc mandarin, which not only isolates it, but permits of the exact limitation of the depth of tissue to be destroyed, and is buried in the axis of the nasal fossa parallel to the septum. The negative pole is placed over the center of the spur, and the positive pole outside or above this latter. An important point is not to put any needle too near the base of the deviation, in order not to expose the septum to perforation. According to the volume and hardness of the growth to be destroyed, the intensity of the current should vary from 18 to 25 ma., the application lasting from twelve to fifteen minutes." Another process that approaches electrolysis in its advantages is galvanic ignipuncture. The knife may be applied flat to the outgrowth or the cautery-point buried little by little in the thickness of the spur. In electrolysis, in *deflections and thickenings of the septum*, Bresgen,² prefers double needles to single. He considers the procedure of value in delicate persons and in cases in which radical treatment was refused. For the turbinated bodies he uses a double needle which at 2 or 4 mm. from the point has a rectangular bend, so that the needles can be driven perpendicularly into the tissue. [We agree with Hajek, Stoerk, Heymann, and Chiari, who considered electrolysis inferior to other means.] In operating upon *deviated septum* Asch³ uses a pair of cutting forceps or scissors with a dull concave blade on one side and a convex cutting blade on the other; the dull blade is introduced into the obstructed nostril, so that a crucial incision may be made, the first cut parallel with the upper lip, and the second as nearly as possible at right angles to the first. The four triangular segments are then bent back and fractured at their bases by the fore finger introduced into the obstructed nostril. The whole of the septum is then broken up with Adams forceps, and a perforated hard rubber tubular splint introduced into the previously obstructed nostril, where it remains for forty-eight hours. It is worn for two or three months. Botey⁴ treats vertical deviations by "subperichondrial resection of a portion of the quadrangular cartilage, followed by consecutive replacement." He makes a horizontal incision from

¹ Jour. of Laryngol., 1894, p. 242.

² Monats. f. Ohrenheilk., Oct., 1894; Jour. of Laryngol., 1895, p. 55; also Wiener med. Woch., Nov. 10, 1894.

³ Jour. of Laryngol., 1895, p. 177.

⁴ Ibid., 1894, p. 317.

the point of junction of the septum with the floor of the nasal fossæ as long as possible and on the side of the concavity; the incision must extend as far back as the beginning of this concavity. This includes all of the inferior insertion of the cartilaginous septum except the mucous membrane of the opposite side. Three vertical incisions on the side of the concavity are made with specially-constructed knives from the vault to the floor of the fossa, one posteriorly near the articulation with the ethmoid, one in the concavity, and one anteriorly; the mucous membrane and the perichondrium are raised, and a portion of cartilage on the posterior edge of the vertical incision and on the inferior edge resected. The flap of mucous membrane is replaced, and the septum set as nearly as possible in the median line. The iodoform-gauze tampon is changed after twenty-four hours. Roe¹ also contributes a paper upon this subject.

Perforations.—French² believes that with proper after-treatment deliberate perforation can be made without injury if breathing-room is required. Delavan³ warns us against making a perforation of the vomer when using the saw. It is often followed by shock out of proportion to the apparent importance of the injury. A paper in which the etiology, clinical significance, and treatment are discussed is contributed by Rupp⁴.

Repair of Nasal Deformities by "intercutaneomucous metallic prosthesis" is recommended by Chaput:⁵ "I surround the nose with an incision in the shape of a U, the concavity turned downward, and the lower ends corresponding to the lower edges of the alæ nasi, after which I dissect up and throw back the flap thus described, taking care not to injure the mucous membrane of the nasal cavities." Three holes for the points of the gilt-silver metal tripod are drilled, one at the level of the nasal spine of the frontal bone, the other two being placed on the superior maxilla a short distance external to the alæ nasi. To avoid perforating the nasal mucosa, this must be loosened with a raspatory for about 1 square cm. on the inner aspect of the maxilla; after placing the metal tripod in position, it is covered with the skin-flap, which is brought back to its original position and sutured with silkworm gut. When the skin of the nasal region is absent, Chaput would take two square flaps from the cheeks and suture them to each other in the median line, with the epidermis down and the raw surface outward. Then, a few days later, freshen with a curet the raw surface of these flaps, place the tripod in position, and cover the whole with a large frontal flap, from which also he would form the lower septum. Delorme reported unfavorably upon the operation proposed by Martin and performed by him upon 3 patients. He prefers the operation of Chaput. Hopkins⁶ describes an improvement of Martin's framework for use in plastic operations on the nose. It is cut from a single sheet of platinum one-fiftieth of an inch thick. A V-shaped piece is cut from

¹ N. Y. Med. Jour., 1894, p. 424; Internat. Med. Mag., Aug., 1894.

² N. Y. Med. Jour., Dec. 1, 1894; Jour. of Laryngol., 1894, p. 425.

³ Jour. of Laryngol., 1895, p. 176.

⁴ Med. Rec., Dec. 22, 1894.

⁵ Sem. méd., Jan. 4, 1895.

⁶ N. Y. Med. Jour., June 8, 1895.

the center of the broad upper end of the bridge, and the supporting arms, which are set into holes drilled in the superior maxillary bones, are broader and thinner than in the original.

Seiss¹ believes that the *remote effects of intranasal operations* are frequently unfortunate. The cautery is frequently employed [by incompetent rhinologists] in the early stages of sclerotic rhinitis, and the progress of that disease with its unpleasant aural and laryngeal sequelæ greatly hastened. Excessive nasal irritability, spasmodic asthma, and marked constitutional depression are common sequels of the energetic use of destructive agents in vasomotor conditions.

Operations on the septum frequently result unfavorably; the triangular cartilage, owing to its scanty blood-supply, being especially intolerant. The indiscriminate *removal of the pharyngeal tonsil* is condemned. Persistent crust-formation in the pharyngeal vault due to atrophy, and nasolaryngeal irritability are common, while he has "seldom if ever seen the brilliant improvement in hearing in cases of *catarrhal deafness after operations for adenoids*; few weeks pass that he does not see cases of acute or chronic ear-disease directly traceable to these procedures." [With this statement we cannot coincide.]

Osseous Occlusion of the Posterior Nares.—Cases, most of them congenital, are reported by Gougenheim,² Frèche,³ Beausoleil,⁴ Scheppegegrell,⁵ and Winslow.⁶ In Frèche's case it was due to hereditary syphilis.

Synechiæ.—Moline⁷ recommends the use of laminae of celluloid in the treatment of synechiæ of the nasal fossæ.

Orbital Abscess of Nasal Origin.—Guermann⁸ advises, when fluctuation is not yet distinct and no symptoms requiring immediate intervention exist, that we should attempt evacuation of pus through the nose, but in cases in which the symptoms are urgent the abscess should be opened at the point of fluctuation. Then irrigate with a weak mercuric-chlorid solution, and drain with iodoform-gauze until the eyeball has resumed its normal position.

Antiseptics in Nasal Operations.—J. Wright⁹ advocates the thorough use of antiseptics before and after operations on the nose. His experiments tend to controvert those of Wurtz and Lermoyez¹⁰ as to the germicidal quality of nasal mucus.

Cauterization of the Nares.—In a report upon this subject and the accidents that may follow it, Ingals¹¹ reaches the following conclusions, based upon 3000 cauterizations in 2600 private patients: 1. It is important that antiseptic applications be regularly employed after cauterization of the nasal

¹ Therapeut. Gaz., Nov. 15, 1894.

² Ann. des Mal. de l'Oreille, etc., 1894, No. 1; ref. Am. Jour. Med. Sci., May, 1894.

³ Soc. d'Anat. de Bordeaux, April 23, 1894.

⁴ Jour. de méd., Bordeaux, July 8, 1894.

⁵ Annals of Ophthalmol. and Otol., April, 1894.

⁶ Am. Med.-Surg. Bull., Feb. 15, 1895.

⁷ Jour. of Laryngol., 1895, p. 90.

⁸ Sem. méd., Mar. 15, 1895.

⁹ Annals of Ophthalmol. and Otol., April, 1894.

¹⁰ Lancet, Oct. 7, 1893.

¹¹ Trans. Ill. State Med. Assoc., 1894, p. 392.

mucous membrane, and that the nostril be closed by cotton for several days, whenever the patient is out of doors, to prevent taking cold. 2. As a rule, at least two weeks should intervene between operations upon opposite sides, and three or four weeks between those on the same side. 3. No serious results are at all likely to follow cauterizations made in this way. 4. Practically, all cases of hypertrophic or intumescent rhinitis may be cured by this treatment, though occasionally portions of the turbinated bones must be removed.

In a Report upon Nostrums¹ the use of catarrh snuffs containing cocaine in dangerous quantity is commented upon by Ingals, and the profession urged to take some action for the protection of the public.

Digital Examination of the Nasal Passages.—Harrison Allen² extols this procedure, urging the great value of the sense of touch in making a diagnosis. He reports at length 24 cases to illustrate various conditions in which the method is of value. The patient is etherized and cosmolin is applied to the little finger of the left hand, with which the examination is made.

Instruments.—Anderson³ describes a nasal saw devised by him. The cutting edge of the blade is 35 mm. long, and the straight handle, of the shape and roughness of a three-sided file, is 80 mm. long, each of its sides 10 mm. wide; one flat side is uppermost.

Nasal Polypi.—Casselberry,⁴ in discussing nasal polypus, its association with ethmoiditis, and its treatment by resection of the middle turbinated body, advises a vigorous surgical treatment, having for its object—first, access to, and then eradication of, the actual seat of attachment, most frequently in the vicinity of the hiatus semilunaris. For the eradication of the attachment upward beneath the middle turbinated body he has recently substituted for the cautery-point, before recommended, a small sharp curet, with which the borders of the hiatus and the bulla ethmoidalis are well scraped. In a former paper, in 1891, he advised as a part of the radical treatment removal of the anteroinferior part of the middle turbinated body, in order to give freer access to the actual point of development. Polypus is commonly one of the earliest prominent manifestations of ethmoiditis, and resection of the middle turbinated body, in addition to its efficacy for the polypi themselves, is regarded as a prophylactic measure against the development of the more serious suppurative type of ethmoiditis and infection of the maxillary, frontal, and sphenoidal sinuses by facilitating drainage of the ethmoid cells.

Kalisher⁵ describes the heretofore little studied *nerve-supply of nasal polypus*. A case of *nasal polypi associated with asthma* is reported by Collier.⁶ The patient had suffered from severe chronic asthma for eleven or

¹ Trans. Ill. State Med. Assoc., 1894, p. 74.

² Univ. Med. Mag., May, 1895.

³ N. Y. Med. Jour., Feb. 23, 1895.

⁴ Trans. Am. Laryngol. Assoc., 1894; Med. News, 1894, p. 621; Jour. of Laryngol., 1894, p. 419.

⁵ Archiv f. Laryngol., 1894, II. ii.; Am. Med.-Surg. Bull., March 1, 1895.

⁶ Annals of Ophthalmol. and Otol., Jan., 1894.

more years. There were numerous polypi obstructing both nasal cavities; these were removed and the asthma disappeared. After a few months the polypi and asthma returned together. The polypi were once more removed, and the patient entirely restored to comfort. Courtade¹ reports 3 cases of asthma cured by ablation of mucous polypi.

Vascular Polypi attached to the Septum.—Heinmann² reports 5 cases of vascular polypi which had been removed from the septum nasi in patients from two to fifty years old. The symptoms were profuse bleeding, pain, and nasal obstruction. The growths were removed either by the snare, forceps, or the galvanocautery. There was no recurrence excepting in 1 case. Cases are also reported by Scheier³ and Alexander.⁴

Turbinal Varix.—Wingrave⁵ defines turbinal varix as a particular form of hypertrophy that involves the posterior end of the inferior turbinated body and characterized by a permanent distention of the venous sinuses. The peculiar villous macroscopic appearance was seen microscopically to correspond with a cystic invagination of the surface epithelium, covering distended loops of vessels with very thin walls, imbedded in mucoid tissue; that is, connective tissue, in which the matrix-mucin was in excess of the fibrous reticulum and cells. The muscular walls of the vascular sinuses presented well-marked atrophy and degeneration, varying from simple thinning to complete disappearance. In places this intervening mucoid tissue simply formed their boundaries, whilst in other parts the walls seemed to have undergone fibrotic changes. This condition is therefore not a mere hypertrophy of the structures, but consists of a true degeneration and infiltration of the walls of these vascular spaces, for while the walls are gradually losing their power of *active* recoil, the vessels by degrees become more and more distended, and a permanent enlargement ensues, which is in fact a varix. Wingrave prefers for their removal the draw-knife of Carmalt Jones. [We would favor the cold-wire snare or galvanocautery *ecraseur*.]

Headache and Neuralgia due to Turbinal Disease.—Mayo Collier⁶ reports one case of severe facial neuralgia lasting five years due to obstruction by polypi and necrosis of the middle turbinated body, and another of headache of five years' duration due to similar trouble. Similar cases were referred to by Dundas Grant, Cagney, and others at the same meeting of the British Laryngological Society. Nothing new in this direction has been published during the year.

Nasal Reflexes.—This subject was discussed in the usual fashion at the Pan-American Medical Congress, September, 1894. The principal papers on the subject were read by Merrick and Roe. Merrick held that no one of the most generally accepted views as to how the reflexes are cured is wholly true or wholly false. These are—1. By cure of intranasal disease; 2. By coun-

¹ Soc. de Méd. pratique, Apr. 19, 1894.

² Jour. of Laryngol., 1894, p. 447.

³ Ibid., 1894, p. 449.

⁴ Ibid.

⁵ Brit. Med. Jour., Nov. 24, 1894; Jour. of Laryngol., 1894, p. 789.

⁶ Jour. of Laryngol., 1894, p. 810.

terirritation; 3. By moral effect. Roe discussed reflex epilepsy from nasal disease.

Glycosuria of Nasal Origin.—Bayer¹ relates the first recorded cases due in all probability to complete nasal obstruction, although the etiologic influence of diseases of the lungs has already been demonstrated. Cure resulted upon establishment of free nasal respiration.

Ozena.—Hunter Mackenzie² believes that the atrophy, which is characteristic, is due to the pressure of the hardened crusts upon the mucous membrane. He endeavors by curetment to replace the diseased membrane by new tissue. After curetting he applies a mixture of ichthyol and olive oil. Wroblewski³ has obtained good results in the treatment of atrophic nasopharyngeal affections from the application of pure tincture of iodine. After cleansing and using a 5 per cent. solution of cocaine the iodine is lightly applied with a small brush of absorbent cotton. The applications are made at first every second day; later on, once a week. Sulzer⁴ reports 2 cases of optic neuritis occurring in patients who had ozena. The amount of eye-trouble varied with the nasal condition. Tissier,⁵ in an anatomic, pathologic, and clinical study of ozena, considers the cause to be a necrotic osteitis of the ethmoidal cells or sphenoidal sinus, caused primarily by bacterial invasion. He uses the syringe, curet, and iodol insufflations. Estien⁶ irrigates with microcidine, 1 : 1000, and then applies solutions of silver nitrate (from 1 : 20 to 1 : 5) or of zinc chlorid (from 1 : 100 to 1 : 10). D. B. Kyle⁷ advises the application (1) of an irritant (*e.g.* oil of mustard, gtt. vj, to ʒj of benzoïnol) which will cause an acute inflammation; (2) after ten days a stimulant antiseptic. Muschold,⁸ in discussing the treatment of ozena (rhinitis atrophicans fetida), recommends a glycerol-borax solution as a spray. Bresgen,⁹ supporting Grünwald's views, reports 11 cases of ozena cured by operative treatment of the disease usually found in the accessory cavities—in 9, the sphenoid.

Vibratory Massage.—Very earnest pleas in favor of this treatment were made at the International Medical Congress at Rome by Braun, Laker, and Dionisio,¹⁰ and, notwithstanding the fact that its therapeutic worth is still *sub judice* in the minds of many, a brief statement of Braun's method and results will be of interest. For the two movements, "stroking" and "vibration," he employs copper probes which are held like a pen. The probe has an olivary extremity, and is slightly roughened below this in order to fasten the absorbent cotton more securely. The cotton should project 2 or 3 cm. beyond the end of the probe, and be so rolled as to maintain the necessary consistence and elasticity when in use. Braun's method in atrophic rhinitis with crusts is as follows: Having carefully removed all

¹ Wien. med. Presse, 1894, No. 15, p. 576; Med. News, May 19, 1894.

² Brit. Med. Jour., April 27, 1895.

³ Sem. méd., April 26, 1895.

⁴ Annales d'Oculist., Jan., 1895.

⁵ Annales de Méd., Nov., 1893, and Jan. and Mar., 1894.

⁶ Thèse de Paris, 1894.

⁷ Med. News, May 5, 1894.

⁸ Deutsch. med. Woch., March, 1894, No. 20.

⁹ Münch. med. Woch., 1894, Nos. 10 and 11. ¹⁰ Jour. of Laryngol., 1894, pp. 259-264.

crusts and mucus, he commences the vibrations with a probe which has been dipped in a 20 per cent. solution of cocain: then with the other probes, which have been saturated with 10 per cent. solution of, for example, iod-glycerol, he "vibrates" successively the floor, inferior meatus, inferior turbinated body, middle meatus, middle turbinated body, septum, the upper part of each of the nostrils, and finally the entire cavity. The nasopharynx is similarly treated, and, if there has not been too great reaction, the process is repeated in the afternoon. Pain and hemorrhage indicate lack of skill. In seven years he has employed the method upon nearly 3000 patients, variously afflicted. He has cured completely 62 cases of ozena in which the number of treatments varied from 4 to 250. Passing over hundreds of cases of chronic catarrh, he mentioned "35 cases of glossodynia, a case of hay-fever, 42 cases of nasal asthma, and 78 cases of neuralgia of the trigeminal nerve, all completely cured." Dionisio substitutes for the probe, worked by hand or electricity (Freudenthal, Stoerck, Garnault, etc.), an apparatus by which one may produce as many as 400 vibrations a minute. This consists of an India-rubber bag which is introduced into the nasal cavity and blown up with air, so as to come in contact with nearly all parts of the mucous membrane. The bag communicates by a tube with an air-chamber in which, by means of a piston, one obtains rapid increase and intermission of pressure. One can give to the piston from 200 to 4000 oscillations a minute. Laker¹ believes that the result of direct massage is not only upon the superficial cells, but upon the deeper layers as well. He considers the hand superior to all instruments, and, to the objection that it is tiresome to the physician, states that 30 sittings can be given during an afternoon without fatigue. Black² describes an ingenious probe-attachment to a dental engine and hand-piece.

Treatment of Purulent Rhinitis in Children.—Dedieu³ advises nasal irrigations ($\frac{1}{2}$ to 1 pint), twice daily, of tepid solutions of boric acid 5 per cent., resorcin $\frac{1}{2}$ to 1 per cent., potassium permanganate 1:1000. Weber's syphon is used, and the patient leans forward and breathes with the mouth open. In connection with irrigations he uses four or five times a day one of the following ointments, which is put in the nasal vestibule and sniffed up by the child or allowed to melt in the nostril, the child lying on his back:

R.	Boric acid,	10.0;
	Vaselin,	50.0.
Or,		
R.	Resorcin,	0.50;
	Vaselin,	50.0.

When the discharge has lessened considerably he uses a spray of $\frac{1}{2}$ per cent. silver nitrate and insufflates—

¹ Wiener med. Presse, 1894, No. 24.

² N. Y. Med. Jour., Dec. 22, 1894.

³ Sem. méd., March 8, 1895.

Ry. Iodol,	0.50 ;
Boric acid,	20.0.

Lewy and Tissier¹ have written on the subject also.

Dreyfuss² reports a case of periostitis and suppuration of the left inferior turbinated body which was due to caries of a tooth.

Coryza Caseosa.—McBride³ reports 3 cases and briefly reviews the literature. The symptoms varied considerably in the individual cases. [Judging from the case reported, it would appear somewhat difficult to make of the disease a distinct clinical entity.]

Fibrinous Rhinitis.—Gerber and Podack⁴ contribute a most valuable paper upon this subject. In all 5 cases described the Klebs-Loeffler bacilli were found, associated, as a rule, with a few streptococci. The authors adduce cases to establish the contagiousness of the affection, and strongly recommend rigid isolation. The possibility of a rhinitis fibrinosa with another cause is not denied. The bibliography attached to the article is fairly complete. Another paper worthy of mention is that of Felsenthal.⁵ Vladar⁶ recommends cauterization with chromic acid, followed by iodoform-insufflations. Murdock⁷ reports a case of fibrinous rhinitis that recurred five times in three and a half years. Sections stained by Gram's method showed a few groups of micrococci of no special significance. Ravenel⁸ makes an important contribution to the study of the etiology of fibrinous rhinitis. Twelve cases are reported, and the conclusion reached that all cases should be considered as diphtheria until the contrary has been proved by cultural methods.

Rhinoliths.—Cases are reported by Bark,⁹ Noquet,¹⁰ and Didsburg.¹¹ In the latter's case there was no nucleus, and he thinks it was the result of inflammation with deposit of secretions and calcareous matter. Bergeat,¹² believing that the early removal of sequestra is of great importance, urges the use of acids, applied on a probe, to decrease their size. Rhinoliths may be similarly treated. Brindel¹³ reports a tooth situated at the entrance of the right nasal fossa that caused severe cough and laryngeal spasms. Sometimes three or four attacks in the day occurred, and on two occasions the spasm approached syncope. The symptoms disappeared on removal of the tooth. Atkin¹⁴ removed a nasal osteoma by making an incision into the nostril from the attached margin of the lip, round the nose up to the lower margin of the orbit, the bone being cut with hammer and chisel. Other reports upon nasal tumors which may be mentioned are those of Delavan,¹⁵ 3

¹ Archiv. f. Kinderheilk., 1894, vii.; Am. Med.-Surg. Bull., May 15, 1894.

² Wien. med. Presse, 1894, No. 5.

³ Brit. Med. Jour., Nov. 24, 1894; Jour. of Laryngol., 1894, p. 657.

⁴ Deutsch. Arch. f. klin. Med., April 11, 1895.

⁵ Pester med.-chir. Presse, 1894, No. 16.

⁶ Med. News, May 18, 1895.

⁷ Bull. méd. du Nord., Sept. 14, 1894.

⁸ Münch. med. Woch., Mar. 19, 1895.

⁹ Quart. Med. Jour., Sheffield, July, 1894.

¹⁰ Münch. med. Woch., Jan. 15, 1895.

¹¹ Jour. of Laryngol., 1894, p. 619.

¹² Jour. of Laryngol., 1894, p. 813.

¹³ Thèse de Paris, 1894.

¹⁴ Rev. de Laryngol., etc., Jan., 1895.

¹⁵ Am. Med.-Surg. Bull., Apr. 15, 1895.

cases of cystic polypi; Onodi,¹ sarcoma; Luc,² myxoma; Knight,³ fibroma; and Jones,⁴ carcinoma.

Tubercle-bacilli.—Strauss⁵ found tubercle-bacilli on the crusts and other mucus in the nasal cavities of 29 healthy subjects who were pupils and nurses in the hospital. Two cases of nasal tuberculosis are recorded by Broeckaert.⁶ Lake⁷ recommends thyroid extract in lupus of the nose, the dose varying from 7 to 17 grains daily. Considerable improvement was shown in 2 cases.

Syphilis.—Le Bart⁸ epitomizes all published cases of primary chancre of the nose and nasal fossæ, 37 in number, with 2 of his own. Chapuis⁹ also describes a case. The symptoms and differential diagnosis are well given. Euditz¹⁰ reports a case in which the chancre occurred on the lower border of the septum between the nostrils. Bazenerge¹¹ studies the various manifestations of nasal syphilis and describes some new cases. Scheinmann¹² reports 3 cases of gummata of the lower turbinated body. If no ulceration exists, and if there are no other gummata about the nasal passage, the diagnosis may be very difficult. Gummata are to be distinguished from hyperplastic formations by their solid consistence, and from malignant growths by their smooth surface. Mendel¹³ reports a case in which a necrosed bone was retained in the nose for four and a half years.

Rhinoscleroma.—Pawlowsky¹⁴ has treated 2 cases by a chemical extract of cultures of rhinoscleroma bacilli. In a patient eighteen years old the disease had made no progress after one year of continuous treatment. The injections are followed by a local reaction, and Pawlowsky believes that he has in this extract both a diagnostic and a therapeutic agent.

Anosmia.—Joal¹⁵ recommends intranasal carbon-dioxid douches twice daily. The gas was obtained by reversing the apparatus used for carbon-dioxid water, opening the valve to let the excess of liquid escape, and introducing the tube into the nostril.

Nasal Affections occurring in Infectious Diseases, and their treatment, are discussed by Ziem¹⁶ and Rice,¹⁷ while Loeb¹⁸ reports a case of double nasal atresia due to small-pox.

Epistaxis.—Kohn,¹⁹ after discussing the etiology of nose-bleed at considerable length, and the more usual methods of treatment, recommends that the patient be directed to keep the mouth wide open—to breathe through the mouth more deeply and more rapidly than he normally does, up to 30

¹ Ref. Am. Jour. Med. Sci., May, 1894.

² Ibid.

³ Am. Med.-Surg. Bull., Jan. 15, 1895.

⁴ Gaz. therap., 1894, xviii, No. 3, p. 159.

⁵ Bull. Acad. de Méd., July 3, 1894.

⁶ Rev. Int. de Rhinol., 1894, iv, p. 230.

⁷ Jour. of Laryngol., 1895, p. 165.

⁸ Thèse de Paris, 1894.

⁹ Gaz. des Hôp., July 19, 1894.

¹⁰ Soc. franç. de Dermatol., Feb. 14, 1895.

¹¹ Thèse de Paris, 1894.

¹² Jour. of Laryngol., 1894, p. 448.

¹³ Bull. Soc. de Laryngol. de Paris, June, 1894.

¹⁴ Deutsch. med. Woch., 1894, Nos. 13 u. 14; ref. Jour. of Laryngol., 1894, p. 591.

¹⁵ Sem. méd., May 10, 1895.

¹⁶ Münch. med. Woch., Dec. 4, 1894.

¹⁷ Am. Med.-Surg. Bull., Mar. 15, 1895.

¹⁸ Jour. Am. Med. Assoc., Jan. 19, 1895.

¹⁹ Med. Record, June 9, 1894.

respirations per minute. When he tires of the rapid breathing he may breathe normally for a few minutes, and then, if necessary, breathe rapidly again; the mouth is to be kept open constantly, and any blood flowing into the pharynx swallowed. Finally, he tells the patient to enunciate the broad "a" with each expiration, so that the soft palate may come in contact with the posterior wall of the pharynx. He considers ten-drop doses of *Hydrastis canadensis* given in water every two or three hours a sovereign preventive. Miot¹ concludes that electrolysis (interstitial positive) should be the method of choice in all cases of severe epistaxis in erectile or varicose tissue; silver or copper needles are the best, the current of 16 to 20 ma., the sittings from eight to ten minutes. The method, in conjunction with tampons or ergotin, was successful in one patient who for ten years had had very frequent and severe hemorrhages, sometimes producing syncope. The galvanocautery and astringents had been used without success. Additional references to the subject are—Baumgarten,² Tautil,³ and Cozzolino.⁴

The Antrum of Highmore.—Myles⁵ classified the various pathologic conditions observed, with their appropriate treatment, as follows: 1. Acute, without complete stenosis of the outlet; 2. Acute, with stenosis: these demand evacuation; 3. Subacute chronic catarrh or suppuration with moderate stenosis, thickened mucosa, with or without retained decaying purumucoid debris: these he considers the most fruitful source of postnasal catarrh, and the treatment is to irrigate, or, if necessary, curet and drain; 4. Polypoid degenerations, to be treated by large counter-openings, packing, careful and repeated curetting, irrigation, and drainage; 5. Odontic periostitis and periodontitis, sometimes terminating in caries and necrosis: in these cases remove the tooth, and, if of long standing, open the cavity, curet, etc.; 6. Atrophic rhinitis: in one variety, in which the retained semisolid debris keeps up the condition, we should irrigate; in a second, the tissues have undergone degenerative changes and operation is necessary; 7. Tumors, in which early diagnosis is important; 8. Syphilis: gummata frequently develop in the walls of one of the accessory sinuses.

An interesting discussion of this subject by members of the Laryngological Society in London is reported.⁶ Each of the various methods of treatment had its advocate. Dundas Grant thought alveolar puncture was too exclusively employed. It was possible to miss the antrum, and he had seen the puncture so made that the irrigation fluid was extravasated into the tissues of the cheek. Before resorting to the more extensive operation through the outer wall of the antrum he would recommend the Krause trocar, with irrigation, drying the cavity by blowing in air, and insufflations of iodoform or euphphen in cases in which there were no diseased teeth, when the patient could attend for treatment, or when the alveolar opening had

¹ Rev. de Laryngol., June 1, 1894; Jour. of Laryngol., 1895, p. 86.

² Rev. Internat. de Rhinol., etc., Aug. 10, 1894; Brit. Med. Jour., Nov. 10, 1894.

³ Thèse de Paris, 1894.

⁴ Vratich, 1894, No. 92.

⁵ Jour. of Laryngol., 1895, p. 201.

⁶ Ibid., 1894, p. 381.

been maintained for a long time and the disease had reached a stationary stage. Scanes Spicer had not had a single cure on treating chronic empyema by the usual openings through the alveolar ridge, and he now makes a large opening in the canine fossa, and a second one with the Krause trocar, so that the patient could keep the antrum clear after curetment by blowing air from the nose through the antrum to the mouth, and vice versa, constantly, and also by washing out the antrum frequently by forcing antiseptic washes through it from the mouth. After curetment the cavity is to be tightly packed with creolin-gauze, and especially so as to distend the buccoantral opening. The gauze is removed after forty-eight hours. Care must be taken to avoid injury to the nasal duct, the infraorbital and dental nerves. He had never seen deformity result. Treatment by this method had been uniformly successful. Talbot¹ examined 6000 antrums, and found 1274 abscessed molar teeth; of this number, 76, or about 6 per cent., extended into and apparently discharged into the antrum. Septa were found in 963 cases. In 384 pulpless teeth he had observed disease of the antrum 4 times. Fletcher of Cincinnati in 1000 antrums, in which 252 upper molars had abscesses, found that 12 perforated the antrum. He therefore concludes that diseased antrums are rarely due to abscessed teeth. Talbot thinks the best place to open the antrum is at the base of the malar process, midway between the root of the second bicuspid and first permanent molar. He uses a hard-rubber flanged drainage-tube which can be softened in hot water and moulded to any position required. Law² reported a case of empyema in which the possibility of over-treatment in the way of washing out the antrum is emphasized. Irrigation, which was unnecessary when the observation was made, had been practised daily for three years. De Roaldes³ reports a case of compound follicular odontoma of the right maxillary sinus in a boy nine years old. There was obstruction of the right nasal fossa. The whole of the anterior wall of the antrum was removed in order to get free access to the tumor. Panas⁴ reports a case of suppuration of the maxillary sinus and coexisting abscess of the orbit, with exophthalmos and amaurosis of the affected side. The patient died of meningitis, and examination of the pus showed that the sinus-suppuratation was due to staphylococcus aureus, while that of the meninges was due to streptococcus—a secondary infection. The perforation was in the floor of the orbit through the lesser wing of the sphenoid. Daly⁵ urges *early* operation in diseases of the antrum, chiefly because he believes that the change of benign into malignant growths is not at all uncommon. Sudduth⁶ discusses the antrum of Highmore in its relation to vocal resonance. [He hardly establishes any connection between them.] Dunn⁷ reports a case of carcinoma of the antrum of Highmore. It was preceded by and associated with nasal polypi, and Richardson⁸

¹ Jour. Am. Med. Assoc., Nov. 24, 1894.

³ N. Y. Med. Jour., Nov. 17, 1894.

⁵ N. Y. Med. Jour., Nov. 10, 1894.

⁷ N. Y. Med. Jour., Sept. 29, 1894.

² Sem. méd., April 26, 1895.

⁴ Sem. méd., March 15, 1895.

⁶ Jour. Am. Med. Assoc., Nov. 17, 1894.

⁸ Am. Jour. Med. Sci., May, 1894.

reported a case of a nasomaxillary myxosarcoma. Other papers of general interest are those of Burger,¹ Garel,² Herzfeld.³

Frontal Sinus.—To irrigate the sinus Lermoyez⁴ uses a cannula bent to a right angle 6 or 8 mm. from the end. The narrowest point in the fronto-ethmoidal passage is in the anterior portion of the ethmoid connecting the hiatus with the sinus. Here the cannula must be rotated so that its beak is directed a little internal to the side of the nasal wall. Hajek washes out the sinus with a 3 per cent. boric solution; this failing, with a 5 to 10 per cent. boric solution of silver nitrate. Zaufal, after laying bare the entrance to the infundibulum, daily evacuates the pus by means of an air-douche directed into the sinus through a fine India-rubber tube. Martin⁵ reports a cure, in four months, of frontal-sinus empyema by catheterism through the nasal ostium and injections of iodoform and silver-nitrate solution. Grant⁶ in one case secured nasal drainage in the following way: The sinus was opened by incision just below the supraorbital ridge. An Eustachian catheter was introduced into the sinus, and its beak passed downward into the upper orifice of the infundibulum. Through this a long piece of soft pewter wire was pushed until it reached the inferior meatus, when it was pulled out through the anterior naris. An India-rubber drainage-tube was slipped over the end of the pewter wire and slid down till it also reached the floor of the nose. This was soon removed, but the discharge did not lessen until the anterior portion of the middle turbinated body was removed by strong cutting forceps. Winkler⁷ examined 33 cadavers to determine how often the sinus may be trephined from the inner side of the middle turbinated body. On the 66 sinuses he succeeded 35 times. No estimate can be made as to the size of the sinuses or of the thickness of their bases. In 22 cases the floor was a firm plate from 2 to 5 mm. thick. In 16 cases the floor above and close to the septum was thick, but became thin a little farther to the side. In men scarcely one-sixth of the cases could be probed, but more than half could be trephined. In women one-fourth could be probed and one-half trephined. Müller⁸ reports most of his cases as due to influenza. In empyema of the sinus ptosis is well marked at the onset, while the swelling of the eyelids is less so; in abscess of the orbit the ptosis is proportionate to the swelling of the lids. Fuchs has resected all of the mucosa lining the sinus with its anterior bony wall, recovery following in three weeks.

The Ethmoidal Cells.—Baumgarten⁹ distinguished the following varieties of empyema: 1. Simple caries and necrosis of the ethmoid; 2. Cario-necrosis with the formation of suppurating cavities; 3. With formation of polypi; 4. With an ossifying tendency. In the discussion Hajek,

¹ Am. Jour. Med. Sci., May, 1894.

² Province Med., 1894, Nos. 21 and 22.

³ Langenbeck's Archiv (Centralbl. f. Chir., July, 1894).

⁴ Ann. des Mal. de l'Oreille, Jan., 1894; ref. Jour. of Laryngol., p. 743, 1894.

⁵ Jour. of Laryngol., p. 370, 1894.

⁶ Ibid., p. 496, 1894.

⁷ Archiv f. Laryngol., l. ii.; ref. Jour. of Laryngol., 1894, p. 865.

⁸ Sem. méd., Dec. 7, 1894.

⁹ Monats. f. Ohrenheilk., Oct., 1894; Jour. of Laryngol., 1895, p. 55.

Chiari, and Rethi contended that diseases of the ethmoid bone were comparatively rare; the use of the probe for the purpose of diagnosing carious bone (Woakes, Grünwald, and Baumgarten) was strongly condemned by them. Dunn¹ reports a case of mucocele involving the anterior middle and posterior ethmoidal cells.

Milligan² reports a case of empyema of the ethmoidal cells in a patient suffering from an acute suppurative inflammation of the anterior ethmoidal cells. A large swelling appeared at the right inner canthus, with edema and pain; mucopus filled the right nostril, and when this was removed a swelling was seen in the middle meatus. The external swelling was incised, the extensive cavity carefully curetted, and a large opening made into the right nostril, followed by irrigation with a 1:3000 mercuric-chlorid solution and packing with iodoform-gauze for three days, and later by daily irrigation. It was a question whether such extensive trouble could result from the severe cold in the head which the patient contracted three weeks before operation. In a discussion on empyema of the accessory cavities at the 1894 meeting of the British Medical Association, Symonds reported interesting cases of chronic suppuration in the ethmoid associated with nasal polypi. His treatment in these cases was to remove the granulations by means of a double curet, together with portions of the middle turbinated body, and occasionally to apply chromic acid. The aim of the treatment was to open up the sinuses and allow free drainage. The cautery was not used, but rather condemned. Daily dressing with pledgets of boric cotton he considered essential for anything like rapid cure. In 2 cases which resulted fatally the disease was primarily in the ethmoid. In both there was extension to the orbit; in one case a spontaneous escape of pus through the upper lid took place; in both cases there was an abscess of the frontal lobe, causing death; in one case the frontal sinuses were also involved. Symonds concluded that the ethmoid should be reached by external incision when the disease has resisted treatment through the nose. Lermoyez³ recommends the use of the curet and the cautery in the middle meatus, resection of a portion of the middle turbinated body if necessary, and a puncture in the bulla ethmoidalis by means of a small straight trocar which has a movable shoulder, so as to prevent the point entering more than $\frac{1}{2}$ cm., irrigation to follow with 1 per cent. lysol solution, or plugging with iodoform-gauze after aspiration of the pus.

Sphenoidal Sinus.—Interesting cases of empyema of the sphenoidal sinus are reported by Herzfeld,⁴ who found in 3 out of 4 cases distinct swelling close to the septum, which he considered of diagnostic importance. He considers probing of the natural aperture rarely possible. Hardie⁵ reports a case of empyema of the sphenoidal sinus and posterior ethmoidal cells in a boy who became suddenly blind a few days before coming under observation.

¹ Virg. Med. Month., Nov., 1894.

² Jour. of Laryngol., 1894, p. 502.

³ Ann. des Mal. de l'Oreille, etc., Jan., 1894; Jour. of Laryngol., 1894, p. 744.

⁴ Jour. of Laryngol., 1894, p. 449.

⁵ Trans. Ill. State Med. Assoc., 1894, p. 409.

Grant¹ reports two cases in which severe headaches, etc. were relieved by the removal of portions of enlarged middle turbinated bodies and subsequent curetting and irrigation of the sphenoidal sinus. Nichols² reported a case of recurring osteosarcoma that began apparently in the sphenoid. It later on affected the ethmoid. Laurent³ believes it possible in many cases to catheterize the sphenoidal sinus without a speculum. His experiments were upon cadavers. The end of a cannula curved at an obtuse angle is passed parallel to the direction of the septum, while the handle of the instrument is kept parallel to the dorsal line of the nose. At the depth of $6\frac{1}{2}$ cm. the point is turned outward for about one-quarter of a circle. The mouth of the cannula is lowered, and the point penetrates directly backward and outward, permitting the exploration of the sinus. Herzfeld⁴ emphasized the connection of sphenoidal empyema with ozena. He had seen, in 3 of his 4 cases, a swelling of the septum at the level of the anterior wall of the sphenoidal sinus, which he considered a diagnostic point of some importance. Flatau in 26 cases had seen empyema of the sphenoidal sinus only once in connection with ozena. With Flatau, Rosenberg and Schwabach agreed that in most cases the etiology was doubtful or unknown. Among papers treating of empyema of the accessory cavities in a general manner are those of Bresgen,⁵ Myles,⁶ Symonds,⁷ and Caldwell.⁸

Hay-fever.—The most complete monograph of the year upon hay-fever is that of Joal.⁹ His conclusions, in favor of which he presents many facts, are as follows: Hay-fever is a neuropathic nasal reflex, of which there are three predisposing factors: the rheumatic diathesis, the nervous, and nasal hyperexcitability. In the majority of individuals affected there are evidences of lowered nutrition and of neurasthenia. There is an incompatibility between hay-fever and serious nervous disease. The vasomotor swelling of the nasal mucous membrane and the paroxysms are coincident; they may appear independently of hypertrophy, but a certain degree of hyperesthesia of the pituitary membrane is discoverable. The vasomotor and spasmodic reflexes are under the control of the secondary nasal reflexes. These last originate in (1) sensory excitations, and (2) excitations that depend upon general sensibility. Among the first Joal gives the first place to odors, the next to luminous impressions; on the other side, heat and dust, either as skin-irritants or mechanic irritants to the nasal mucous membrane. The specific action of pollen and of certain microorganisms is not admitted. In 105 patients who are able to give information as to the causes that appeared to excite the paroxysm, 64 noted an olfactory cause—alone in 23—in combination with other causes in 41; in 45 the attacks appeared to be determined by light; 41 mentioned marked elevation of temperature; 38 com-

¹ Jour. of Laryngol., 1894, p. 497.

² Ibid., 1894, p. 755.

³ Ibid., 1894, p. 821.

⁴ Ibid., 1894, p. 449.

⁵ Münch. med. Woch., July 31 and Aug. 7, 1894.

⁶ Am. Med.-Surg. Bull., Feb. 15, 1895.

⁷ Brit. Med. Jour., Dec. 15, 1894.

⁸ N. Y. Med. Jour., vol. lviii, p. 526.

⁹ Rev. de Laryngol., etc., Nos. 7 and 8, 1895.

plained of dust alone or with other excitants. As showing the great effect of the uric-acid diathesis, Joal found among 127 patients a family history pointing to this in 107 cases, and in 67 cases among his 71 adult patients the diathesis was well marked. Evidences of neurasthenia were elicited in 101 of his 127 patients. [The limitations of neurasthenia as understood by the author are by no means exact.] As to the effect of nasal lesions, while not speaking in any uncertain fashion, Joal does not give them that prominence which it has been the fashion to accord to them, and his observations appear largely to have been confined to the question of hypertrophy of the mucous membrane. In children the nasal changes were not so frequent as in adults; among the latter hypertrophy was present in 47 cases, absent in 18. In 42 out of 107 of all ages the nasal mucous membrane appeared to be normal. An interesting discussion of the subject¹ of hay-fever took place at the Pan-American Medical Congress. Delavan² deprecates the not uncommon practice of operating upon the nose during epidemics of la grippe and when the patient is suffering from hay-fever.

The Tonsils.—Sendziak,³ in discussing so-called acute follicular angina, contends that it should be named acute lacunar tonsillitis. As to etiology, in favor of its infectious origin are both the clinical picture and its appearance epidemically, especially in families. Against the opinion of Jurasz the author maintains that tonsillar hypertrophy predisposes to the disease. He agrees with B. Fränkel, Goldscheider, etc. that it is not diphtheria. Examination of the pseudomembrane shows staphylococci and streptococci and the pseudodiphtheritic bacillus. Clinically, it is not always possible to distinguish it from diphtheria, especially when the membrane is diffuse, without a bacteriologic examination. As local treatment Sendziak prescribes gargles of salol (5 per cent. alcoholic solution, a teaspoonful to a glass of lukewarm water). Maurel⁴ also concludes that acute tonsillitis is an infectious disease. Sonnenberg⁵ recommends ichthyol in 2 or 3 per cent. solution as a gargle every ten or fifteen minutes in acute catarrhal sore throat.

In the treatment of nondiphtheritic sore throat⁶ is recommended, for adults, equal parts of guaiacol and glycerol; in children, 1 part guaiacol and 2 of glycerol; apply four times in twenty-four hours. An alkaline gargle is used in conjunction with the guaiacol. Fournier⁷ recognized syphilitic ulcer of the tonsil in 40 per cent. of his cases of ulcers of the mouth. The sore is generally single, and sometimes covers the whole tonsil, occasionally extending to the pillars of the fauces and to the base of the tongue. The erosive form is the most common; the symptoms are trifling; the ulcerative form causes pain and dysphagia: the ulcers are brown, gray, or yellow, and the tonsil is indurated. The anginal form is the least frequent. There are

¹ Jour. of Laryngol., 1894, p. 759.

² Jour. of Laryngol., 1894, p. 234; 1895, p. 263.

³ Medycyna, June 9, 1894.

⁴ N. Y. Med. Jour., June 8, 1895.

⁵ Thèse de Paris, 1895.

⁶ Sem. méd., Jan. 4, 1895.

⁷ Bull. méd., Nos. 9 and 10, 1895.

present ulceration, pain, dysphagia, and some systemic disturbance. In the differential diagnosis of these ulcers, as well as in the initial syphilosclerosis of the tonsil without ulceration, the chief points are—the character of the associated adenopathy, the persistency (five to eight weeks) and one-sidedness of the lesions, and the time of appearance and course of the disease.

Cases of chancre of the tonsil are reported by Gradenigo and Peroni¹ and Chappell.²

Woodhead,³ in an address on “The Channels of Infection in Tuberculosis,” demonstrates the danger to the individual which may result from the presence of diseased lymphoid tissue, particularly the tonsils. The tubercle-bacillus and other microorganisms are taken up by the weakened lymphoid cells, which are unable to destroy them, and the infection spreads from gland to gland. Interesting observations upon infection in the alimentary tract of the pig, cow, and guinea-pig are recorded to show that tubercular infective material may be swallowed as well as inhaled.

Gougenheim⁴ deprecates too hasty operative intervention in suppurating or phlegmonous tonsillitis, and recommends—1. For pharyngeal pain, Leiter's coil around the neck, leeches to the angle of the jaw, painting the pharynx with a 20–33 $\frac{1}{3}$ per cent. solution of cocaine; 2. For adenitis, cold cataplasms containing laudanum; 3. For the local inflammation, irrigations of the nose and the pharynx with warm boric-acid solution; 4. As an intestinal anti-septic, naphthol or salol, 2 g. daily. He operates only on the appearance of a whitish spot revealing the purulent focus.

As to latent tuberculosis of the three tonsils, Dieulafoy⁵ inoculated portions of tonsils removed from children into 61 guinea-pigs, and 8 became tuberculous; adenoid vegetations from 35 cases and 7 of the guinea-pigs became tuberculous. He distinguishes three stages: 1. Latent tuberculous, the bacillus causing a multiplication of phagocytes and enlargement of the tonsils. This process by the development of fibrous tissue in the tonsil may not extend, but frequently does so; 2. The submaxillary and cervical lymphatic glands are invaded, and from these there may be extension through the lymphatics until the thoracic duct or right lymphatic duct is reached, whence the bacillus is carried to the right side of the heart; 3. From the heart it may finally reach the lung. Fatty diet is recommended. In the discussion Cornil criticised Dieulafoy's conclusions on the grounds that the histologic examination of adenoid vegetations from 70 cases showed tubercular infection only 4 times, and that inoculation-experiments were open to the fallacy that tubercle-bacilli might be lying on the mucous surface in the anfractuosités of the adenoids or in the crypts of the tonsils, and the tuberculosis be thus produced on inoculation.

Buschke⁶ reports 2 cases that seem to indicate that microbes are able to

¹ Internat. klin. Rundschau, 1894, No. 10, p. 336.

² Med. Rec., 1894, p. 104.

³ Lancet., Oct. 29, 1894.

⁴ Lyon méd., 1894, xxvi. p. 490.

⁵ Bull. de l'Acad. de Méd., April 30, May 7, 14, 1895; Brit. Med. Jour., June 1, 1895.

⁶ Sem. méd., Jan. 11, 1895; Deutsch. Zeitschr. f. Chir., xxxviii. 4, 5.

penetrate into the blood through the healthy mucous membrane of the tonsils, and thus set up acute osteomyelitis. One patient, fourteen years old, subsequent to an attack of sore throat developed typical osteomyelitis of the left tibia. *Staphylococcus aureus* was found in the blood as well as in the pus of the osteomyelitis, and in the crypts of the tonsils.

The Pharynx.—Symmetric congenital defects and anomalies in the anterior pillars of the fauces are reported by Hamilton¹ and Garel.²

[Many cases of tumors of the soft palate and pharynx have been reported, but, with the exception of the treatment of sarcoma by the toxins of erysipelas in combination with those of *bacillus prodigiosus*, nothing unusual has been suggested in the way of treatment. We have, however, deemed it wise to give a few references to some of the more interesting cases of pharyngeal tumor which have been reported during the year.] Chamberlin³ injected from 17 to 35 minims of the toxins of erysipelas and *bacillus prodigiosus* in a patient who had a round-cell sarcoma of the right tonsil which had recurred after removal. The patient was apparently well on the road to recovery when the case was reported, seven weeks after the first injection. Schmitt,⁴ alveolar sarcoma of the soft palate in a boy aged twelve; Eisenmenger,⁵ lymphosarcoma of the pharynx and the soft palate; Montaz,⁶ pharyngeal lymphosarcoma; Cleveland,⁷ epithelioma of the soft palate—operation with the galvanocautery knife—entire healing taking place in two weeks; Sherwell⁸ removed an unusually large tumor (carcinoma?) which grew from the hyoid fossa and base of the tongue, without recurrence after five months; Labit,⁹ lymphangioma of the palate; Roe,¹⁰ fibrolipoma of the pharynx in a woman aged forty-nine: this variety is the rarest of pharyngeal tumors; Machell,¹¹ papilloma of the tonsils.

Attention should also be directed to a paper by Gleitsmann,¹² who urges the importance of an early diagnosis of malignant tumors of the throat.

Tuberculosis of the Pharynx.—Porter¹³ discusses primary tuberculosis of the pharynx; Griffin¹⁴ reports a case of tuberculosis of the pharynx; and Zarniko¹⁵ contributes a general paper upon the subject. Kiaer¹⁶ reports 3 cases of acute miliary tuberculosis of the pharynx in patients aged six, twenty-three, and fifty-five years, respectively. The cases were in all probability primary, as the changes in the lungs were recent as compared with

¹ N. Y. Med. Jour., May 5, 1894.

² Virginia Med. Monthly, June, 1895.

³ Wien. klin. Woch., 1893, No. 52.

⁴ Med. News, 1894, p. 458.

⁵ Rev. de Laryngol., etc., 1894, No. 24.

⁶ Jour. Am. Med. Assoc., 1894, p. 491.

⁷ Ibid., Nov. 10, 1894.

⁸ Med. Mirror, v., 1894, p. 491; Am. Med.-Surg. Bull., N. Y., April 1, 1895.

⁹ N. Y. Med. Jour., Feb. 16, 1895.

¹⁰ Aerztlicher Verein in Hamburg, meeting April 17, 1894; ref. Jour. of Laryngol., 1894, p. 559.

¹¹ Ugeskrift f. Laege, 1894, No. 52.

¹² Rev. de Laryngol., etc., 1894, xv. p. 489.

¹³ Münch. med. Woch., 1894, No. 10, p. 188.

¹⁴ Dauphiné médicale, July, 1894.

¹⁵ Am. Med.-Surg. Bull., No. 15, 1894.

¹⁶ Jour. Med. Sci., Dec., 1894.

¹⁷ N. Y. Med. Jour., Jan. 19, 1895.

the local ulceration in the 2 cases in which an autopsy was performed. In the adults dysphagia was the first symptom, and in the child the larynx and pharynx appeared to be simultaneously affected.

According to Heymann,¹ strictures of pharynx and larynx consequent upon syphilis are most frequent in the tertiary stage, and nearly always the result of ulcerating gummatous tumors. Their most frequent seat is the lower pharynx at the base of the tongue, just above the epiglottis. They may occur in secondary syphilis. Treatment is in his experience often ineffective. Lublinski considered these affections rarely due to hereditary syphilis.

Lymphosarcoma of the Pharynx and Larynx (initial stage) is discussed by Stoerk.² In his experience the diagnosis of lymphosarcoma in the pharynx and larynx has hitherto never been made during life by laryngoscopy or rhinoscopy. For years the author [and with him certainly many others] has observed lymphosarcoma in the nasopharyngeal space, but he is compelled to state that he never diagnosticated the disease. In all cases he made the diagnosis of syphilis in recent cases or in more advanced processes of carcinoma. Only the examination of extirpated portions revealed the truth. Without a microscopic examination weeks and months would elapse. The main obstacle to the diagnosis of lymphosarcoma is the fact that patients come under our observation when ulceration of the neoplasm has appeared. Since this exhibits no peculiarities, and even simulates syphilis to the extent of improving temporarily on cauterization, he was confirmed in his wrong diagnosis. As a result of the observation of several years he wished to report on certain changes by which the diagnosis can be made without microscopical examination. At first there appears in the nasopharynx an exuberant mass resembling adenoid vegetations, but of different texture. We are consulted by adults only rarely on account of adenoid vegetations, because their respiration is not hampered, but more frequently when the growths cause certain sensory changes in the nasopharynx. On palpation the vegetations feel much firmer than adenoids in young people. When the exuberant granulations reach the level of the uvula, they have usually begun to ulcerate, and the process has already descended on both sides from the vault. He is unable to explain the ulceration. Then the anomalies of sensation set in. If local and internal antisiphilitic treatment did not affect the process and if the ulceration spread, he suspected a malignant neoplasm. He knew of no other in these regions than carcinoma or round-cell sarcoma. He quotes several cases in which he and others used antisiphilitic treatment and operated without success. One operation was rather satisfactory. A woman of forty-five had a large mass in the nasopharynx, the softness of which promised well for the result of operative measures. He removed the tumor, used iodoform-gauze with resin, and later on repeatedly cauterized the base with chromic acid. The woman still lives and feels very well. Histologically, the tumor proved to be a granuloma, probably originating from an

¹ Sem. méd., Mar. 8, 1895.

² Wien. med. Woch., 1894, Nos. 40-44.

adenoid swelling. One typical case may be reported here. A woman twenty-two years old complained of impermeability of the nose, nasal twang of voice, continuous headache, and at times dyspnea. A pale-red tumor was seen above the soft palate. It did not feel very hard and was somewhat movable. Extirpation of the tumor was postponed, the patient being anemic to an extraordinary degree. Billroth, in consultation, favored removal after division of the soft palate in the middle line, deciding in favor of the benignity of the disease because of absence of enlargement of the lymphatic glands, although the tumor had existed for more than a year. Stoerk split the soft palate on one side in preference to the middle line, because the pharyngeal constrictor muscles draw the tissues partly to the left, partly to the right, thus increasing the disturbance of speech and the loss of tissue. The growth was removed by a large forceps and spoon without anesthesia. The hemorrhage was terrific. Breathing and speaking manifestly improved. Histologic examination showed the growth to be a lymphosarcoma. A few months afterward recurrence was reported. Stoerk declined to operate again, but heard that the patient died a year after a second operation.

Quincke's Disease.—A case of edematous swellings of the palate and pharynx, so-called Quincke's disease, is reported by Law.¹ The patient suffered chronically from similar skin-lesions. The uvula was in contact with the sides of the mouth; great difficulty in swallowing and symptoms of suffocation were experienced. The symptoms subsided after two or three hours. The etiology of the disease is unknown. Strübing described the same disease as angioneurotic edema.

Rheumatism and Throat-affections are discussed by Roos,² Richmond,³ Freudenthal,⁴ and Wagner,⁵ who consider that rheumatic affections are in many cases due to the immigration of microorganisms from the tonsils when these latter are diseased.

Pharyngomycosis.—Ingals⁶ places 12 cases on record; of these, 8 were successfully treated by the galvanocautery heated a bright red and passed one-eighth of an inch into the tissue below the patches. Two or three patches should be cauterized at one time, and the operation is repeated two or three days after all soreness from the former operation has disappeared. Papers have also been contributed by Bresgen⁷ and Thomas.⁸

Sarcoma of the Palate.—Johnson⁹ reported before the New York Academy of Medicine a case of sarcoma involving the soft palate, and to a lesser degree the hard palate, pillars of the fauces, tonsils, part of the pharyngeal wall, base of the tongue, and upper part of the larynx, which

¹ Jour. of Laryngol., 1895, p. 371.

² Berlin. klin. Woch., 1894, Nos. 25, 26.

³ Pacific Med. Jour., Sept., 1894.

⁴ Med. Rec., Feb. 16, 1895.

⁵ N. Y. Med. Jour., Oct. 27, 1894.

⁶ Trans. Am. Laryngol. Assoc., 1894, p. 37; N. Y. Med. Jour., Sept. 1, 1894.

⁷ Diagnostisches Lexicon für praktische Aerzte; ref. Jour. of Laryngol., 1894, p. 595.

⁸ Med. Rec., xlv., 1894, p. 12; Am. Med.-Surg. Bull., Oct. 1, 1894.

⁹ Jour. of Laryngol., 1895, p. 47.

was successfully treated by the hypodermic injection of the toxins of erysipelas in combination with the toxins of bacillus prodigiosus. The dose was 15 minims, gradually increased to 40 minims, every other day, and the treatment lasted, with intermissions, from October 31, 1893, to June, 1894. Coley,¹ whose experiments with the toxic products date from 1892, has already reported, in greater or less detail, 47 cases, in 8 of which he obtained very good results. His conclusions were—1. The curative action of erysipelas upon malignant tumors is an established fact; 2. This action is much more powerful in sarcoma than in carcinoma; 3. This action is briefly due to the soluble toxins of the erysipelas streptococcus, which may be isolated and used with safety and accuracy; 4. This action is greatly increased by the addition of the toxins of bacillus prodigiosus; 5. The toxins to be of value should come from virulent cultures and be freshly prepared; 6. The results obtained are so nearly equal to those obtained from an attack of erysipelas that inoculation with the latter should rarely be resorted to.

The Nasopharynx.—A case of cyst of the nasopharynx was reported by Wright² at a meeting of the New York Academy of Medicine. Lincoln³ reports the successful removal under ether of a very large fibroma by the galvanocautery ecraseur. Kaarsberg⁴ reports favorably upon the use of electrolysis in 4 fibrous tumors of the nasopharynx. A current of from 140 to 340 ma. was employed. A considerable number of cases of nasopharyngeal tumors have been recorded during the year, but nothing particularly new has been contributed in the way of treatment, although Woods⁵ in a case of nasopharyngeal fibroma operated with a "galvanocautery loop-curet" of ingenious construction. Goodwillie⁶ also uses the galvanocautery in fibroid tumors of the nasopharynx, and describes his ecraseur. Berger,⁷ reporting upon a case operated upon by Ollier's method by Cabot, considers that the nasal method of removing nasopharyngeal polypi does not give enough room, and much prefers removal through the palate, or, when necessary, by partial or complete resection of the maxilla.⁸ [The editors cannot agree to this statement.] Delavan⁹ reports the successful removal by Abbe, from a patient aged seventeen, of a nasopharyngeal sarcoma which was attached to the left sphenoidal sinus. A part of the superior maxilla was first removed. Electrolysis, though beneficial at first, had ceased to be effective. Hogan¹⁰ reports an interesting case. The sarcoma had been previously removed nine times by means of a wire ecraseur. Hogan tied back the soft palate, applied cocain (10 per cent. solution), and divided the growth into three sections, which were removed, one at a sitting, with the galvanocautery. There was no recurrence. Other cases and papers

¹ Jour. of Laryngol., 1895, p. 49.

² Ibid., May 26, 1894.

³ N. Y. Med. Jour., May 26, 1894; Jour. of Laryngol., 1894, p. 361.

⁴ Hospitals-Tidende, No. 7, 1894.

⁵ Dublin Jour. Med. Sci., Oct., 1894.

⁶ Am. Med.-Surg. Bull., Dec. 15, 1894.

⁷ Sem. méd., Jan. 11, 1895.

⁸ Vide Sem. méd., p. 618, 1894.

⁹ Jour. of Laryngol., 1894, p. 360.

¹⁰ Ibid., 1894, p. 772.

worthy of mention are reported by Bruns,¹ Dudley,² Annandale,³ Shield,⁴ and Logan.⁵

Adenoid Vegetations.—In discussing the relation obtaining between adenoid vegetations and the growth of children, Casten Malherbe⁶ concludes that during some months after the removal of adenoid growths the rate of growth, as estimated by increase of height, weight, and chest-measurement, was three times the average rate as given in the tables of Quêtelet and Pagliani. [Analysis of the author's tables shows very great differences in the rates observed in individual cases. The general effect, however, is beyond dispute.] Gutzmann⁷ considers adenoid vegetations to be responsible for many disturbances of speech—*e. g.* stammering; their extirpation influences favorably recovery. Marage⁸ has obtained good results in 54 cases by applying on absorbent-cotton swabs a 100 per cent. aqueous solution of resorcin for from 6 to 10 sittings at intervals of two or three days. Hermet⁹ considers the operation too frequently performed. In 103 cases he operated only 14 times. Lermoyez¹⁰ describes a tubercular variety of adenoid vegetations. The histologic examination of the growth, which recurred in a child six years old, demonstrated its tubercular character, giant cells and tubercle-bacilli being both numerous. The child's mother was tubercular. Lermoyez had observed 2 cases in which the development of latent tuberculosis appeared to be determined by the removal of the growth. Eustace Smith¹¹ discusses adenoid vegetations from the standpoint of the general physician: 1. One of the commonest symptoms is snuffling, with much mucous secretion in nonsyphilitic infants, and he maintains that persistent snuffling is not a sign of syphilis unless other symptoms are present; 2. A symptom sometimes present in new-born infants is a loud crowing or croaking sound which accompanies breathing—the so-called “congenital stridor;” fatal results may occur from collapse of the lung; 3. Contraction of the chest-wall in the inframammary region is a consequence of collapse in the anterior part of the inferior pulmonary lobes. There may be in addition signs of collapse at the upper part of the lung, associated with deficient resonance and weak, harsh breathing at the suprascapular fossa. At this period of life, too, a high-pitched percussion-note at the suprascapular fossa, without notable alteration of the breath-sounds, is commonly due to a patch of pulmonary collapse, and is very suggestive of adenoid growths; the tissue, being of low vitality, is wanting in phagocytic power, and may serve as a door of entrance for tubercle-bacilli; 4. Their influence upon the nervous system is very important; among local effects are laryngismus stridulus and crowing breathing; among general nervous effects are reflex convulsions and asthma; 5. Ear-affections; 6. A predisposition to colds; 7. Gastric derangements.

¹ Beiträge zur klin. Chir., Ed. xi.; Centralbl. f. Chir., Leipzig, Aug. 11, 1894.

² Brooklyn Med. Jour., Jan., 1895.

³ Practitioner, Dec., 1894.

⁴ La Presse méd., Mar. 31, 1894.

⁵ Sem. méd., April 5, 1895.

¹⁰ Ann. des Mal. de l'Oreille, Oct., 1894.

³ Lancet, vol. i., No. 7, p. 398, 1894.

⁵ Jour. of Laryngol., 1894, p. 772.

⁷ Sem. méd., p. 107, March 1, 1895.

⁹ Ibid., April 19, 1895.

¹¹ Lancet, May 25, 1895.

Another discussion of the subject upon similar lines is contributed by Charnier.¹ Chiari² contributed to the Eleventh International Congress at Rome a statistical study based upon 233 cases in private and 152 in hospital practice. The percentages to all diseases of the throat and nose were 4.5 and 3.8, respectively, a variation that may be explained by the fact that the poorer classes observe less frequently whether the child sleeps with open mouth, etc. As regards age, there were—under ten, 130; from ten to twenty, 196; over twenty, 37; the four oldest were aged respectively forty-two, forty-six, fifty-one, and fifty-nine. In 233 private cases the faucial tonsils were enlarged in 39; in 39 there was atrophic rhinitis with crusts; in 24, abnormally wide nasal passages. Posterior rhinoscopy in 206 out of 233 private patients showed that in 34 the vegetations reached the velum; in 36 they covered more or less the inferior turbinated bodies; in 72 the middle turbinated bodies; and in 58 they reached only to the upper border of the middle turbinated bodies. The treatment always consisted in the removal by means of a cold steel-wire snare (wire 0.36 mm.) introduced through the nose. In 233 private cases removal was complete in 113, in 9 partial; in 46 operation was refused; in 11 the snare was also used from behind; once Catti's forceps, twice the snare from behind only, and once Gottstein's ring-knife, were used in the operation. Cure resulted in one sitting 66 times; in two, 56; in three, 33; in four, 7; in nine, 1. The advantages claimed are absolute freedom from danger, slight bleeding and reaction, and painlessness. [We think this last statement is not to be taken literally.]

In a paper based upon the study of 100 cases of hypertrophy of the pharyngeal tonsil Ingals³ reaches the following conclusions: Hypertrophy of Luschka's tonsil is comparatively infrequent, occurring in only 2 per cent. of the patients with diseases of the chest, throat, and nasal cavities, and probably in not more than $\frac{1}{2}$ of 1 per cent. of all cases. In the vicinity of Chicago the disease is apparently 50 per cent. more frequent in the country than in the city, and it occurs more frequently in girls than in boys. It is observed in 90 per cent. of the cases before the fifteenth year of age, and is probably always developed in infancy or early childhood, some cases appearing to be congenital. Ten per cent. of the cases are apparently hereditary. Sixteen per cent. may be attributed to frequent colds, but in 63 per cent. no etiologic factor can be discovered. In the great majority of cases the affection is apparently due to the same causes as enlargement of the faucial tonsils, and in 76 per cent. of the cases the faucial tonsils are also hypertrophied. In a considerable number of cases, amounting to 18 per cent., the general health is materially injured by this affection. The sense of smell is obtunded or lost in 11 per cent. Hypertrophy of Luschka's tonsil is a frequent cause of headache, it being present in 27 per cent. of the cases. It is a frequent cause of deafness, the hearing being affected in one-third of the cases. The deafness so caused may be benefited in a large majority (70 per

¹ *Le Méd. enfant*, Dec., 1894.

² *Jour. of Laryngol.*, 1894, p. 687.

³ *Jour. Am. Med. Assoc.*, Sept. 29, 1894.

cent.) of cases by operative procedures, 66 per cent. being greatly ameliorated, and about half of these being completely cured. The disease causes much alteration in the voice in about 70 per cent. of the cases. In nearly eight-tenths of these the voice may be greatly improved as the result of treatment. In about 40 per cent. of the cases there is decided dyspnea, resulting from partial closure of the nasopharynx. Forty per cent. of these patients have more or less cough, in about one-third of which it is quite severe. The pharyngeal follicles are enlarged in about one-fourth of all the cases. The nasal cavities are more or less closed by swelling or hypertrophy in 50 per cent. of the cases, and 56 per cent. complain of catarrhal symptoms, but in about nine-tenths of these the symptoms are removed by extirpation of the glandular tissue. Although deterioration of the general health is not usually complained of, it is found as the result of operation that in many cases great improvement occurs immediately, the patient often gaining 30 per cent. in weight within six months.

Grönbech¹ contributes his experience with the symptom-combination of adenoid vegetations and nocturnal enuresis: 13 per cent. of his cases of adenoids suffered in this way, and removal of the growths nearly always effected a cure. In a paper which he read at the meeting of Dec. 26, 1894, of the New York Academy of Medicine (section of Laryngology) Hopkins² asserted that recurrence of lymphoid hypertrophy in the nasopharynx does sometimes take place even after thorough removal. He reports 3 original cases, 1 of which may be cited here: In a girl of fourteen Hopkins operated under ether, removing both tonsils and clearing out the nasopharynx. The hearing improved, also the general health, but in a year a large mass of lymphoid tissue again obstructed the nasopharynx. Even after the second operation recurrence took place. Hopkins also reported 6 cases which had been furnished by McKernon, Delavan, Butts, Wright, and Emil Mayer. He thought there should be a complete removal of the tissue under a general anesthetic in children under fifteen, and that coexisting nasal obstruction must also receive attention. After the operation appropriate tonic treatment (iron, etc.) should be given for several weeks. In the interesting discussion that followed the importance of radical and thorough operation was strongly insisted upon. Morgenthau³ recommends ethyl-bromid anesthesia in removing adenoid vegetations. Two drams are poured on a little gauze or cotton in a chloroform mask covered with oiled silk, and held closely over the mouth of the child, who is held in a sitting posture by an assistant. In a minute or less anesthesia is complete, and it lasts for two or three minutes. The question as to the safeness of the anesthetic is judiciously discussed.

Among other papers on adenoid vegetations may be mentioned those of Farlow,⁴ Ray,⁵ and Franks.⁶ Lavrand⁷ believes that the transverse flatten-

¹ Archiv f. Laryngol., 1894, II. ii., p. 214.

² Jour. of Laryngol., 1895, p. 195; Am. Med. Surg. Bull., Jan. 15, 1895.

³ Chicago Med. Rec., March, 1895.

⁴ Brooklyn Med. Jour., Jan., 1895.

⁵ Med. and Surg. Rep., 1894, lxx. p. 74.

⁶ Dublin Jour. of Med. Sci., March 1, 1895.

⁷ Rev. de Laryngol., 1894, p. 687.

ing of the external nose and the deformities of the upper jaw and hard palate result from the gentle but constant pressure upon these bones of the muscles of the upper lip and cheek in habitual buccal respiration. They act as an elastic band.

Bednar's Aphthæ.—Fränkel¹ carefully discusses the so-called Bednar's aphthæ. The most important symptom is localization over two symmetric parts of the hard palate. The affection is benign and merely local; it is only observed in the new-born. It has no etiologic relation to the small vesicles sometimes found in the region of the raphe of the hard palate. Anatomic examination of the mucous membrane shows that there is no difference in the thickness between the parts in which the aphthæ are localized and the other parts. Also *in vivo* neither by extreme distention of the jaws nor by other movements is the mobility of this part of the mucous membrane produced. The histologic examination of four specimens of the disease showed that the affection begins with the entrance of bacteria between the epithelium; then follows an elevation of the epithelium. In the vacuum so produced there often develops a serous exudation, and sometimes laceration of the mucous membrane. The author believes that careful cleansing is the best treatment.

Bullous Affections of the Mouth.—Rosenthal,² in a contribution to the bullous (Blasenbildend) affections of the mouth, asserts that he has observed 3 such cases. Three men, aged about thirty, had a disorder of the mouth, manifested by blisters which arose on the mucous membrane of the tongue, the lips, the palate, and the pharynx. At the same time there were vesicles on the genitals, cyanotic in appearance, with a red areola. The disease was erythema bullosum, with localization in the mouth. The attacks occurred in all cases in spring and harvest-time. The author concluded that local pemphigus of the mucous membrane of the mouth is an erythema bullosum, a special form of erythema multiforma. Characteristic is the tendency to recurrence.

Carcinoma of the Mouth.—Rolles³ reports a case in which, for the upper inch and a half, the trachea and esophagus were surrounded by a dense contracting growth that necessitated tracheotomy and gastrostomy. The thyroid was involved. After death no primary disease was found in the trachea or esophagus, nor did the disease arise in the thyroid gland—whether in a bronchial cleft or an accessory thyroid the author could not say. He did not think that it was situated in the lymphatic glands.

Soor.—Mettenheimer,⁴ in discussing soor at an advanced age, gives a description of some cases in which soor arose in the mouth of marasmic or sick aged people. If the affection is not treated in a rational manner, the patient sometimes dies from cachexia.

¹ Jahrbuch des Hamburgischer Staatskrankenhauses, Jahr. 1892-93, Hamburg, Leopold Voss, 1894; ref. Jour. of Laryngol., 1894, p. 856.

² Deutsch. med. Woch., No. 26, 1894; ref. Jour. of Laryngol., 1894, p. 856.

³ Brit. Med. Jour., May 5, 1894; Jour. of Laryngol., 1894, p. 856.

⁴ Memorabilien, Jan., 1894.

Mundseuche.—Siegel¹ describes an epidemic of "Mundseuche." Concerning the therapy of the disease, the internal use of sodium salicylate has had nearly as specific an effect as in acute rheumatism; sodium dithiosalicylicum also gave good results. The best local treatment of the vesicles was touching with silver nitrate. Of the serum-treatment not much good is reported. The bacteria described by the author are confirmed by further investigations by some well-known bacteriologists. In a child who succumbed to the disease postmortem examination revealed swelling of the solitary follicles of the intestine, combined with ulceration. The Peyer's patches also were red and swollen, and the mesenteric glands were enlarged. By inoculation of the bacilli in calves the disease could be produced, so that their specificity is proved. The same bacillus as that found in man is found in animals dead of Klauenseuche. The bacteria (photographed in the original) are 0.5 to 0.7 mm. in length; the center is not so clearly colored as the ends. By this they can be distinguished from other microorganisms.

Gonorrhea of the Mouth.—Rosinski² has examined 5 cases of gonorrhea of the oral mucous membrane in new-born children. There was a white-yellowish discoloration of the palate on both sides of the raphe. Microscopically, it was seen to be not a true pseudomembrane, but a superficial purulent infiltration of the tissue. Between the connective tissue and the epithelium the specific microorganisms could be found. Spontaneous cure followed after some weeks without any cicatrices.

Disinfection of the Mouth.—Szana³ describes a new method of disinfection of the mouth and pharynx. By experiments with colored fluids he found that in gargling only the soft palate and the root of the tongue are touched by the fluid. Therefore he believes that gargling is ineffectual. The entire mucous membrane of the mouth and pharynx is touched by the saliva. He recommends disinfecting pastilles of saccharinum and resina guaiaci. He proved the disinfecting power of this by bacteriologic examination of his saliva. Before the application he found culturable microorganisms in it; after the application they had disappeared.

The Tongue.—Price Brown⁴ had a case of epithelioma of the tongue in which the patient had been operated on for removal of the growth previous to coming under notice. The growth occupied the center of the tongue, commencing a little over an inch from the tip and extending backward about an inch and a quarter. With the cautery-knife two incisions, joining anteriorly and posteriorly and three inches long, were made, extending from the base to near the tip of the tongue. The operation lasted two hours, and very little hemorrhage occurred. Four months later a slight recurrence took place, and recourse was again had to the cautery. Six months after the second operation the patient was reported as quite conva-

¹ Deutsch. med. Woch., Nos. 18 and 19, 1894; Jour. of Laryngol., 1894, p. 594.

² Jour. of Laryngol., 1894, p. 593.

³ Pester med. und chir. Woch., No. 6, 1894; Jour. of Laryngol., 1894, p. 454.

⁴ Ontario Med. Jour., Dec., 1892.

lescent. Brown states that had ordinary surgical methods been pursued nearly the whole organ must have been sacrificed, whereas the tongue had been retained, for all practical purposes, in its entirety.

Chiari¹ exhibited a patient forty-eight years old with a hard tumor on the dorsum of the tongue. The tumor was removed by the galvano-cautery, and examination proved it to be of a fibrous nature. Cure followed.

Butlin² contributes a clinical lecture on a series of 46 cases of removal of one-half or the whole tongue, with one fatal result, which is particularly valuable, but must be read *in extenso*. Perman³ discusses sarcoma of the tongue, with remarks on treatment of similar growths with pyoktanin. The patient observed by the author was a lady of about thirty-four who for about half a year had suffered from slight dysphagia. The visible part of the tumor was about the size of a walnut and was soft, without any ulceration of the surface. It was situated on the right side of the base of the tongue. The tumor disappeared entirely in the course of three months after thirty-one injections of 1 or 2 g. each of a solution of pyoktanin. There was no recurrence one year later.

Kronenberg⁴ contributes a very complete monograph on the pathology and treatment of diseases of the lingual tonsil. For the very painful swallowing that accompanies a persistent tonsillitis lingualis he commends Seifert's cocain applications, but prefers antipyrin or tolypyrin, either alone or with equal parts of starch-powder. The appended bibliography (89 references) is valuable.

The Thyroid Gland.—Kocher⁵ discusses the function of the thyroid gland with relation to the new method of treatment of the several forms of goiter. In 12 cases the author has used the thyroid-gland extract in cases of goiter. In 5 cases observed in the hospital and in 5 out-patient cases a definite influence of the treatment could be observed; the goiters markedly decreased in size, but in no case disappeared. Nearly the same effect is obtained by the well-known iodine treatment. The experience of many years shows that nearly 90 per cent. of all the cases can be improved by the use of iodine; only in 10 per cent. does surgical treatment become necessary. The author therefore does not believe that the new treatment will have any great practical value in the treatment of goiter. Of much greater value is feeding with thyroid gland for treatment of cachexia strumipriva and myxedema. The fact that the same treatment can both decrease the hypertrophied gland and lessen the consequences of the absence of the gland leads to the conclusion that goiter is also a consequence of diminution or deterioration of the normal secretion of the thyroid gland. This is also probable from the fact that cretinism is observed, combined in some cases with hypertrophy and in other cases with atrophy of the thyroid gland. As

¹ Gesellschaft der Aerzte in Wien, June 15, 1894; ref. Jour. of Laryngol., 1894, p. 856.

² Brit. Med. Jour., April 14, 1894.

³ Hygeia, April, 1894.

⁴ Berliner Klinik, Nov., 1894.

⁵ Corresp. f. Schweizer Aerzte, 1895, No. 1; ref. Jour. of Laryngol., 1895, p. 294.

to this theory, it is necessary to review another disease in its relation to the thyroid gland—viz. Basedow's (Graves') disease. Anderson¹ shows that the conditions of rest and activity of the thyroid gland differ from one another by characteristic changes in the epithelium of the gland and the contents of the follicles. Details must be seen in the original. Jeanselme's² paper on infectious thyroiditis and strumitis is a critical review of recent works on this subject. The author believes infection to be the only origin of thyroiditis. The infectious germ is variable, and may result from bacteriologic products of typhoid fever, erysipelas, puerperal fever, etc. This disease, more frequent in women than in men, has been observed as a complication or sequel of every infectious disease. According to the infectiousness of the primary disease, the inflammation is more or less serious, and has a greater or lesser proclivity to suppuration, abscess, or gangrene. The author reviews the principal symptoms of thyroiditis at the different stages of the inflammation, and describes the forms—(1) latent, (2) suppurative with abscess, and with or without accidents of compression of the trachea, (3) dissecting, and (4) gangrenous. Lund³ reports a case, in a girl aged eleven, of cyst of the thyroid, complicated with laryngeal paralysis, dysphagia, and dyspnea. The voice became affected from abductor paralysis of the left vocal cord. After removal of the cyst the voice was improved, but there was no alteration in the condition of the cord.

Mygind⁴ reports a case of thyroiditis acuta simplex. He has also collected 17 cases accurately described and 21 imperfectly reported cases. The etiology is often obscure; acute rheumatism is the most frequent immediate cause. The paper contains a full description of the symptomatology and useful hints as to differential diagnosis.

Spencer⁵ reports a case of the rare fibrosis (fibrous degeneration) of the thyroid. The trachea became involved, so that the cartilaginous rings which had been in contact with the thyroid disappeared and the mucous membrane was thrown into folds, causing dyspnea. A tracheotomy-tube left in for two weeks permanently dilated the stenosed trachea.

Notkine⁶ has isolated an albuminoid, which he calls thyroproteid, from the thyroid glands of cattle, sheep, hogs. It is toxic to animals, and determines symptoms analogous to those of cachexia strumipriva. "The physiological role of the thyroid gland is to rid the organism of the thyroproteid existing in the blood, to store up this toxic substance in the alveoles of the gland, where it is neutralized and rendered harmless, after which it is poured into the circulation to undergo further metamorphoses." Graves' disease, which Notkine considers the result of intoxication of the special thyroid ferment (enzyme) produced in excess, appears to be favorably influenced by the administration of thyroproteid in small doses.

¹ Archiv f. Anat. u. Physiol (Anat. Abtheilung), 1894, Heft 3 u. 4.

² Gaz. des Hôp., Feb. 2, 1895.

³ Brit. Med. Jour., Jan. 5, 1895.

⁴ Jour. of Laryngol., 1895, p. 181.

⁵ Ibid., 1895, p. 363.

⁶ Sem. méd., May 3, 1895.

W. J. Chappell¹ reports the case of a fifteen-year-old boy who had a swelling of the thyroid gland for two years, in which an abscess formed. The gland was swollen and hard; from a small fistula in the isthmus water-like fluid was secreted which contained tubercle-bacilli, showing it to be one of the rare cases of tuberculosis of the thyroid. The lungs were in an advanced stage of phthisis.

Goiter.—Kocher² reports upon 1000 extirpations of goiter. Cachexia strumipriva never follows the operation, as a portion of the gland is left, sufficient to carry on the functions of the latter. In the last 900, in which a portion of the gland was left, and excluding 30 malignant goiters, 11 died, but in 6 only was death the direct result of the operation, and of these 3 were operated upon for Graves' disease, in which extirpation is considered dangerous. Lanz and Trachewski show that ingestion of thyroid extract may in the long run determine complete atrophy of the healthy parts of the gland.

Ballet and Enriquez³ discuss experimental goiter after injections of thyroid extract. The authors have injected in a dog glycerol extract of thyroid juice. During fourteen days the injections were regularly from 4 to 15 c.cm. of extract. After the first injections the dog had diarrhea, fever, tachycardia, and tremors of the limbs. Little by little the thyroid gland was observed to enlarge, especially upon the right side. The injections were intermitted, and all symptoms, local and general, disappeared. After a second series of injections the same hypertrophy resulted. Bruns⁴ relates his experience in the treatment of goiter by feeding with thyroid gland. The author has used this treatment in 12 cases of parenchymatous goiter, using fresh thyroid of calves in doses of 5 to 10 g. It was not tried in cystic goiters, as in them no result was to be expected. Four cases between the ages of four and twelve years were completely cured. In a patient of fourteen the circumference of the neck decreased by 7 cm. in four weeks. In another, six years old, with a goiter on the left side the size of a fist, and compressing the trachea so as to cause dyspnea, the circumference of the neck decreased by 5 cm. in four weeks, and the dyspnea disappeared. In 3 cases there was no improvement. In 1 case symptoms of intoxication appeared—viz. headache, loss of appetite, nausea, loss of weight (10 kilograms). In all other cases the weight decreased by from a $\frac{1}{2}$ to 1 kilogram. The author concludes that in some cases goiter can be cured by the use of thyroid gland.

THE LARYNX.

Tuberculosis.—Chappell⁵ discusses the treatment of laryngeal tuberculosis by the application and submucous injection of beechwood creosote. The treatment of laryngeal tuberculosis with creosote has not received so much

¹ "Case of Tuberculosis of the Thyroid Gland," *Manhattan Eye and Ear Hospital Reports*, Jan., 1894.

² *Sem. méd.*, April 26, 1895.

³ *Bull. Soc. méd. des Hôp.*, Nov. 16, 1894.

⁴ *Deutsch. med. Woch.*, 1894, No. 41.

⁵ *Jour. of Laryngol.*, 1895, p. 355.

attention as that of pulmonary tuberculosis, in which the results have been quite good. For laryngeal applications aqueous and alcoholic solutions of the drug have not been satisfactory; oily solutions are better, because they modify the unpleasant character of creosote and cling for a longer time to the surface. Castor oil is more serviceable, on account of its viscid and tenacious properties:

R _x . Creosote,	5j-ij ;
Castor oil,	5ijj ;
Oil of gaultheria,	5ijj ;
Petroleum,	5j ;
Menthol,	gr. x.

This mixture is a clear, nonirritating fluid with a very agreeable odor and taste, which may be either sprayed into the larynx or applied with a laryngeal applicator. In the milder forms of tuberculous inflammation of the larynx, with a very slight evening rise of temperature, topical applications of the drug may suffice to relieve the symptoms, but when there is active ulceration, with high evening temperature, submucous injections must be made. Thorough cleansing of the larynx is followed by the application of a 10 per cent. cocain solution. In the ulcerative stages creosote (5j to 5j) can be sprayed daily. The slight burning sensation that follows the application lasts only a few moments. Careful judgment determines the frequency of the submucous injection; as a rule, one every five or six days suffices. The injection should be as superficial as possible, and for this purpose the ordinary hypodermic syringe attached to a long needle with the laryngeal curve can be employed. In order to facilitate the procedure and to render it more exact, Chappell has invented an automatic laryngeal syringe. By a rubber casing drawn over the needle the depth of the injection can be measured. The solution may be either warmed or not, one drop being injected at a time. The needle should not be withdrawn for a few moments if possible. Little or no hemorrhage follows the injection. The mucous membrane becomes tense and somewhat redder, but this subsides within a few days. The injections stimulate granulation and arrest progressive ulceration. After the injections the larynx should be kept as clean as possible, and sprayed every day with a weak solution of creosote.

A. H. Smith¹ had found the results of the local treatment very favorable in one case. A very essential part of the treatment is the introduction of the creosote below the mucous membrane. The internal administration of the drug, local applications or inhalations, cannot answer the same purpose. It may be well also to use it in other forms of tuberculosis; for instance, in lupus. Sendziak² contributes a paper on the treatment of tuberculosis of the larynx and lungs by thiosinamin.

Favorable results from the subcutaneous injection of thiosinamin, espe-

¹ Jour. of Laryngol., 1895, p. 357.

² Ibid., 1894, p. 115.

cially in lupus, and partially in pulmonary tuberculosis, were reported by Hebra of Vienna. Thiosinamin, or allylsulphocarbamid, is a white, glistening crystal powder, without odor and with a bitter taste, dissolving in water, alcohol, and ether. Sendziak used 15 per cent. alcoholic solutions of the drug for injections in the interscapular space. They are by no means painless. The dose was at first 0.030 g. of thiosinamin. Injections were made twice a week, afterward oftener, every third, and even every other day, the dose being constantly increased. Sometimes a whole syringe-ful—*i. e.* 0.150 g.—was used. The author sums up as follows: 1. Thiosinamin can, in certain cases, have a positive influence upon the course of the tuberculous process in the larynx; 2. In the lungs the effect seems negative; 3. Upon the general condition the drug, in most cases, does not act satisfactorily; 4. In lupus of the nose it can, Hebra asserts, be applied with comparatively great advantage; 5. It seems not to produce general reaction, but it must be applied with certain precautions in tuberculosis of the lungs and larynx. The results are not encouraging.

Results of the surgical treatment of laryngeal tuberculosis, based on 252 cases, are reported by Heryng.¹ In the first part of his paper² Heryng divided his material into groups according to the duration of the healing of the tuberculous process in the larynx: 1. Perfect cure lasting from five to six years—cases 1 and 2; 2. Cured for about four years—cases 3 to 8; 3. For three years—cases 9 to 11; 4. For two years—cases 12 to 16. To those 16 cases Heryng now adds 4 in which the healing had been established for about a year.

The indications and limits of topical treatment are formulated as follows by Lennox Brown:³ Clinically, laryngeal tuberculosis presents itself in two forms, the acute and the chronic. It is of the greatest importance to ascertain—1. If the laryngeal condition is acute or chronic; 2. The state of the tuberculous disease, whether there be infiltration, ulceration, superficial or deep necrosis, or caries of the cartilages, and the development of any new growths; 3. The pulmonary condition, because the laryngeal disease may reach an advanced stage without any evidences of pulmonary disease being detected. It is vitally necessary to commence topical measures as early as possible, basing the prognosis largely on the question of a coexistence and the stage of pulmonary disease. The results of treatment are thus tabulated:

Pulmonary symptoms.	Cured.	Improved.	Not improved.	Died.	Total.
None	2	7	5	1	15
Slight (one lung) . .	6	16	1	1	24
Severe	1	8	6	16	31
Both lungs involved .	..	3	12	17	32
	9	34	24	35	102

¹ Jour. of Laryngol., 1894, p. 173.² Ibid., 1893, p. 426.³ Ibid., 1894, p. 185.

The author can point to only 1 case in his practice and that of his colleagues at the Central London Throat Hospital in which a cure was effected. The case was very satisfactory, seven and a half years having elapsed since the patient first came under his care. The pharynx, larynx, and one lung were all involved, tubercle-bacilli being demonstrated in the scrapings from the granulations and in the sputum, and, indeed, long after the signs in the lung had disappeared. The lung remained quite healthy (examination about eight months ago), and the woman had gained considerably in weight, and no bacilli could be demonstrated. Curetment is not an absolute *sine qua non*. Menthol or menthol with iodol, in the form of a spray, gives the best results in the preulcerative stage by promoting resolution in the case of a local hyperemia, and by stimulating the capillary circulation in anemic conditions. When there is excessive pain an ethereal solution of aristol in a spray is serviceable. Morphin-insufflations are employed only in hopeless cases, but codeia largely, and cocain only before manipulations, and in advanced cases for dysphagia. Sprays are to be preferred to intralaryngeal insufflations of powders. Excepting for the relief of acute dysphagia, however, he prefers the application of tincture of benzoin comp., tincture of camphor comp., and tincture of belladonna, mixed with the yolk of an egg, immediately before taking food; also the use of lactic acid, which must be rubbed in with considerable force. Previous to ulceration this method of application, as well as the drug itself, is productive of harm rather than good. Curetting, whether of hyperplastic outgrowths or of ulcerations, is necessary before the lactic-acid application is ever really effective, but it is not indispensable to perform a scraping on every occasion when this agent is used, once in every four or six being sufficiently frequent. Curetting is indicated for two purposes: firstly, for the removal of hyperplasia; secondly, to clear away necrotic matter when the ulcers are large, and for uniting the numerous ulcerative points into one surface when, as is generally the case, they are multiple. Lake¹ in a contribution to the pathology of laryngeal tuberculosis expresses his conviction that the surface-infection, of which the shallow tubercular ulcers are the product, is caused originally by the micrococci present with Koch's bacillus in the sputum, and that the ulcerative and tubercular infections are secondary to abscess-formation in the epithelium. He suggests the following as the probable method of infection: The micrococci, which are at rest on the epithelial surface between the attacks of coughing, and especially during sleep, find their way into the interstices between the cells. Some of these are removed by phagocytes; others are, by reason of their numbers, able to establish themselves, and, by destroying the cells and phagocytes, form a small abscess. The abscess ruptures, and is at first, bacteriologically speaking, nontubercular, but by the time submucous tissue is reached, if not earlier, infection with Koch's bacillus occurs. Clark² discusses the rarer manifestations of tubercular disease of the larynx, which appears as smooth, round tumors, single or multiple, or papillomatous

¹ Am. Jour. Med. Sci., April, 1895.

² Ibid., May, 1895.

growths, with little or no evidences of pulmonary tuberculosis. After reviewing the cases of Ariza, Ingals, J. W. Mackenzie, Gussenbauer, Schnitzler, Kidd, Schaeffer and Nasse, Dehio, Hennig, Gougenheim and Tissier, Marty, Cartaz, Dundas Grant, Avellis, Trekaki, Schwartz, and Heryng—in all 42—he adds one observation by himself in which a large, smooth tumor sprang from the left ventricular band. This Clark removed with a cold-wire snare, and on examination it proved to be “a nodule of miliary tubercles growing in submucous tissue.” An examination of the lungs was entirely negative.

In his researches on the condition of the nerves in tubercular arytenoiditis and in the stump of the cicatrix after surgical ablation Dansac¹ finds that side by side with rare lesions of the myelin there always exists a proliferation of the peripheral nervous filaments. This corresponds with the development of the tubercular process. The center of the tubercle, the circumference of the glandular acini invaded by bacilli, and the periphery of fibrous tubercular nodules are constituted essentially by hypertrophied axis-cylinder elements. This explains why in certain cases of arytenoiditis, hyperesthesia is so pronounced, and how ablation of this hyperplastic nerve-tissue is followed by immediate and definite disappearance of dyspnea and dysphagia. Thompson² recommends a 5 per cent. solution of monochlorophenol in tubercular laryngitis. It mixes with the light petroleum oils. Langmaid³ discusses the treatment of laryngeal tuberculosis, but presents nothing new, and Erwin⁴ reports 3 cases treated by tuberculin.

Excision of the Larynx.—Powers and White⁵ report 6 cases of excision of the larynx, and present an analysis of 303 additional cases, of which 240 were collected by Kraus in 1890. In analyzing the 309 operations the authors found that 101 patients died within the first eight weeks from shock, hemorrhage, pneumonia, septic infection, or exhaustion. The mortality was 33 per cent. after complete, and 27 per cent. after partial, excision. The statistics are very unsatisfactory with regard to the ultimate results of the operation in cases of malignant disease. In 108 cases of total laryngectomy for carcinoma, performed prior to 1892, in which the direct results of the operation were not fatal, recurrence occurred in 51 patients during the first year, and 11 patients only were free from relapse three or more years after the operation. Of 77 in whom partial laryngectomy was performed for carcinoma, 26 died during the first two months. Of the remaining 51, 7 are reported as well three or more years after the operation. Of the 6 new cases reported here, 2 of total laryngectomy died in two and a half and twelve months respectively; of the patients on whom a partial laryngectomy was performed, 1 was well at the end of four years.

In an elaborate paper Felix Semon⁶ presents the results of radical operation for malignant disease of the larynx from the experience of private

¹ Jour. of Laryngol., 1894, p. 316.

² Bost. Med. and Surg. Jour., July 19, 1894.

³ Med. Rec., March 23, 1895.

⁴ Am. Med.-Surg. Bull., Jan. 15, 1895.

⁵ Jour. Am. Med. Assoc., Oct. 13, 1894.

⁶ Lancet, Dec. 15, 22, 29, 1894.

practice. The subdivision into intrinsic and extrinsic malignant disease of the larynx is of great practical importance as to the question of undertaking a radical operation. The term "intrinsic" includes the tumors originating from vocal bands, the ventricles of Morgagni, the ventricular bands, and the subglottic cavity within the borders of the larynx proper. The term "extrinsic" is applied to tumors growing from the epiglottis, the posterior surface of the cricoid plate, the arytenoepiglottic folds, and the interarytenoid fold. Number of cases observed: From 1878 to 1894 there were seen 103 cases. [Taking into consideration the natural increase in his practice, the author's experience certainly does not lend any color to the cry of the increase of internal carcinomata—at any rate, not so far as the larynx is concerned.] Not included are—cases seen in hospital service: those in which malignant disease, starting from the thyroid gland, the esophagus, the lymphatic glands in the neck, etc. secondarily invaded the trachea; cases in which an insufficient number of examinations could be made. As to sex, 79 were men and 24 women. This proportion agrees entirely with all previous observations. An extraordinary fact corroborates the observation of others: among 79 male patients, 21 only suffered from the purely "extrinsic" form, but out of 24 women, 15 were affected with this much more intractable form, and in not less than 11 of these the posterior aspect of the cricoid cartilage was the starting-point. As to age—from twenty to thirty years, there was 1; from thirty to forty, 2; from forty to fifty, 25; from fifty to sixty, 43; from sixty to seventy, 19; from seventy to eighty, 10; from eighty to ninety, 3. As to the situation of the growth, in 38 it was extrinsic, in 55 intrinsic, in 10 mixed. Extrinsic growths occur most frequently on the posterior surface of the cricoid; intrinsic, on the vocal cords, so far as could be made out at the advanced stage at which the disease was observed. In the overwhelming majority of cases histologically examined (30–40 cases) squamous-celled carcinoma was found. Radical operation was advised in 16 cases. It is limited to cases of purely "intrinsic" malignant disease—not, however, in cases in which the originally intrinsic disease had either passed beyond the confines of the larynx proper, or in which it was primarily situated on the posterior surface of the cricoid cartilage, or in which affection of the cervical glands was already present. The nature of the operations and proportions of recovery are tabulated:

	Cases.	Recoveries.	Deaths.
Partial extirpation of larynx	3	1	2
Thyrotomy, with resection of portions of larynx	4	4	
Thyrotomy, with removal of soft parts only	4	2	2
Subhyoid pharyngotomy, with removal of soft parts only	1	.	1
	<hr/> 12	<hr/> 7	<hr/> 5

This shows a saving of fully 58.3 per cent. from an otherwise inevitable death. There was recurrence in but 1 case. The phonatory results were equally pleasing, and sometimes surprising. There was septic pneumonia

in 1 case, a result of the use of the esophageal feeding-tube. In 1 case ether was given by the rectum, followed by death twenty-four hours after operation, due to bronchitis and inflammation of the bowels caused by the ether. There was bilateral septic pneumonia in a third case; in the fourth cause of death could not be determined by the autopsy; in the fifth bronchitis and cardiac syncope ensued in a patient of seventy-two with pre-existing bronchial affection. There were 2 cases of doubtful nature, 1 probably a papilloma, the other a fibroma or fibrosarcoma. As to the operation, tracheotomy is first performed, and a Hahn's aseptic compressed-sponge cannula is introduced into the trachea. Fully ten minutes should now be allowed to elapse before the larynx is opened, in order to give the sponge full time to expand and to hermetically occlude the lower air-passage. The thyroid cartilage is laid bare and opened exactly in the middle line, bone-forceps being usually necessary. The sides should be held apart either by broad retractors, or, better still, by two strands of strong silk passed through the anterior parts of the lateral wings. A comparatively large aseptic sponge, secured by a long string, is introduced through the laryngeal wound into the lower part of the pharynx. The whole side to be operated on should be twice mopped with a 5 per cent. cocain-solution, in order to prevent parenchymatous bleeding. One should have a good light with a frontal reflector. Two semicircular or elliptic cuts are now made, uniting in front and behind, through the whole of the soft tissues and down to the perichondrium. The growth is held with dressing-forceps and the whole area cut out with curved scissors, the points of which are firmly pressed against the inner aspect of the cartilage. The base is well scraped with a sharp spoon. In very rare cases only will it be found necessary to apply the galvanocautery. Every source of bleeding having finally been carefully stopped, the whole of the interior of the wound is dusted with deodorized iodoform or with iodoform and boric acid mixed in equal parts, and the sponge-cannula immediately removed. When more or less extensive resection of the thyroid cartilage, or even extirpation of one-half of the larynx, is to be anticipated, the parts of the cartilage to be removed should be freed from their perichondrium and from the surrounding soft parts by means of an elevator. In other respects the operation is the same. When the malignant disease either affects the epiglottis or the arytenoepiglottidean fold, subhyoid pharyngotomy is the most useful mode of operation. The incision should be about 6 cm. horizontally and parallel to the lower border of the hyoid bone, across the neck, followed by division of the thyrohyoid membrane and removal of the growth with curved scissors or the knife. Following Butlin's suggestion, the after-treatment has been greatly simplified. The sponge-tube having been removed at the end of the operation, and the wound having been treated in the manner described, the patient is placed in an almost horizontal position on his side, the side operated upon being lowermost; one pillow only is allowed. Instead of plugging the wound, it is frequently dusted with iodoform and boric acid. The sides of the wound separate when the patient

swallows, so that powder can be blown directly on the raw surface. On the day of operation or on the following day the patient should attempt to drink water whilst leaning with the upper part of the body well over the edge of the bed. Thus he may be spared the necessity of rectal feeding. The wound closes by granulation. It is quite possible that, with further experience, closing the upper part of the wound with ligatures, together with a drainage-tube, may be attempted.

In general, an early diagnosis is of the utmost importance. The first symptom, and for a long time the only one, is hoarseness. It is often thought that the disease manifests itself, above all, by pain, difficulty in swallowing and in breathing, swelling of the glands in the neighborhood of the larynx, and considerable general cachexia. This is quite erroneous as regards the earlier stages—*i. e.* those in which radical operation has a reasonable chance of success.

Booth¹ reports the removal of a large subglottic fibrous polypus by thyrotomy. A longitudinal incision of the thyroid did not afford sufficient room, and a second incision was made in the cartilage at right angles to the first and on the side opposite to the tumor. A three-bladed dilator was inserted and the tumor removed with cutting-forceps. The edges of the cartilage approximated so well that sutures were dispensed with. The skin-incision was closed with a continuous catgut suture and healed by first intention. The voice was good three months later.

Method of Examining the Larynx in Young Children.—Spicer² in operating on a child aged eight perfected a method of examining the larynx and removing laryngeal growths in very young, nervous, or unmanageable children. Five assistants are required—the first to give the child chloroform, maintaining moderate general anesthesia; the second nurses the child in the usual position for laryngoscopy; the third, standing behind the patient, keeps the head erect and square to the operator; the fourth stands behind and to the right, holding the mouth-gag; the fifth holds the tongue out with forceps. The operator first sprays the larynx with 10 per cent. cocain-solution, then mops the throat with absorbent cotton, and finally uses the forceps.

Tremor of the Vocal Bands has usually been attributed to disseminated sclerosis of the medulla, but Collet³ reports a case in which the lesion was confined to the cerebellum and its extensions, the cranial nerves and their nuclei remaining sound.

Ramon de la Sota y Lastra⁴ reports a case of Diphtheric Cricoid Perichondritis and necrosis that presented some very interesting and obscure features. These unfortunately required an autopsy for their elucidation.

Harris⁵ contributes an historical résumé of **Fracture of the Larynx**, and reports a case.

¹ Brit. Med. Jour., April 27, 1895.

² Ibid., Nov. 24, 1894.

³ Annales des Mal. de l'Oreille, etc., 1894; Am. Jour. Med. Sci., May, 1894.

⁴ Jour. Am. Med. Assoc., Sept. 29, 1894.

⁵ Med. News, Feb. 23, 1895.

Semon,¹ in discussing the **Sensory Throat-neuroses of the Climacteric Period**, concludes that in a great majority of cases no other treatment than moral influence is, in his experience, necessary.

Gougenheim² has described a case of **Tubercular Perilaryngeal Abscess** proceeding from disease of the bones of the lowest three cervical vertebrae.

Moll³ reports an **Intralaryngeal Abscess** that ruptured in the vicinity of the right vocal apophysis. It was the first lesion in an attack of influenza with pleuropneumonia.

Beausoleil⁴ describes a unique case of **Laryngocele**. A tumor, about 1 cm. by 0.5 cm., developed immediately above the right vocal band. It arose from violent efforts at coughing in a tuberculous patient. Externally, on the side of the neck, a little in front of and underneath the great cornu of the hyoid bone, was a little tumor, the size of a cherry, which on violent exertion became nearly as large as a mandarin orange. At the autopsy it was found that the mucous membrane had been thrust across the cricothyroid space.

Ingals⁵ described an unusual **Cyst of the Left Ventricular Band and Aryepiglottic Fold**, 1 by 1½ cm. in diameter; general appearance was that of a solid tumor. From 10 to 30 minims of a 30 per cent. solution of lactic acid were injected three times at intervals of two or three days, but proved ineffective, and injections of from 15 to 20 minims of an 8 per cent. solution of phenol in glycerol were substituted. After eight injections at intervals of from four to six days the tumor had almost disappeared. There was no recurrence at the end of three months. Operative procedures were, on account of the position and size of the tumor, out of the question.

Operative Technique.—Swain⁶ states that better results are obtained in laryngectomies in which, after removal of the larynx, the open end of the trachea is stitched to the skin, than by the old method. Inspiration-pneumonia is less frequent, swallowing is easy, and a useful voice is obtained.

Sundry Cases.—Interesting cases are recorded by Péan,⁷ who performed a thyroidectomy followed by resection of the cricoid and five tracheal rings; by Rotter,⁸ total extirpation of the larynx; Wolff⁹ refers to the case of total extirpation operated on by him in 1891; Downie¹⁰ reports a laryngotomy for epithelioma of the vocal cord; Birkett, a case of subchordal spindle-cell sarcoma removed by thyreotomy; there was no recurrence three years after operation; and Chappell,¹¹ sarcoma of the epiglottis.

Semon and Newmann¹² again emphatically disavow any belief in the

¹ Brit. Med. Jour., Jan. 5, 1895.

² Annales des Mal. de l'Oreille, etc., xix. 10; ref. Am. Jour. Med. Sci., Aug., 1894.

³ Ibid. ⁴ Rev. de Laryngol., xv., 1894, p. 681; Am. Med.-Surg. Bull., Jan. 1, 1895.

⁵ N. Y. Med. Jour., Sept. 1, 1894; Trans. Am. Laryngol. Assoc., 1894, p. 37.

⁶ N. Y. Med. Jour., Oct. 13, 1894.

⁷ La France méd., 1894, p. 280.

⁸ Berlin. klin. Woch., Feb. 11, 1895.

⁹ Ibid., July 30, 1894.

¹⁰ Brit. Med. Jour., 1894, p. 575.

¹¹ Am. Med.-Surg. Bull., Nov. 15, 1894.

¹² N. Y. Med. Jour., June 2, 1894.

alleged special liability of benign laryngeal growths to undergo malignant degeneration after intralaryngeal operations, as suggested by Lennox Browne. Bergeat¹ discusses the preferable methods of operation in small tumors of the larynx. Pierce² reports a case of laryngeal papilloma in which aphonia persisted after removal of the growth until labor-pains overcame the patient's hysterical silence. Hunter Mackenzie³ reports a case of laryngeal hemiplegia and malignant papilloma of the brain, in which the unilateral paralysis of the cord was in all probability of cortical origin. Semon and Horsley, from experiments on the monkey, dog, and rabbit, conclude that paralysis from the cortical lesion is always bilateral.

Direct Inspection of the Larynx and the Trachea without a Mirror.—Kirstein⁴ advises a short, thick tube with a bevelled end (similar to the esophagoscope) which is connected with an electroscope, and under its illumination is introduced into the larynx of the patient, who either lies supine with dependent head or sits with the head thrown well back upon the neck. The pharynx and posterior aspect of the epiglottis are previously painted with 20 per cent. cocain-solution. When the instrument is in the erect position the patient breathes through the tube. The view gained is distinctly superior to the reflected image of the laryngoscope, especially the surface view of the posterior laryngeal wall, free from all perspective foreshortening in its whole extent, deep into the trachea. It will be easy to remove the frequent tuberculous diseases of the posterior wall with straight instruments by excising, curetting, or cauterizing. Tumors of the vocal cord, subglottic growths, etc. can in many cases be removed with greater ease and thoroughness than hitherto. Foreign bodies in the trachea can probably be extracted better than through a tracheotomy-wound. Strictures may, in certain cases, be probed by straight, stiff tubes. It may prove of great value in anesthetized children, in whom laryngoscopy is impossible. The author concedes the superiority of the laryngoscope in simple examinations, especially in private practice.

External Examination of the Larynx.—Gerhardt⁵ contributes an interesting paper on this subject. Although laryngoscopy with the mirror alone makes the diagnosis of many laryngeal diseases possible, a consideration of certain extralaryngeal conditions is not superfluous. Examination of the anterior surface of the neck, so far as observations of the movements of the larynx or trachea is concerned, should not be overlooked. In dyspnea respiratory movements of the larynx become visible. These are due to the action of the muscles which approximate the sternum and the lower jaw. In great dyspnea from laryngeal stenosis there is added to the influence of these muscles that of rarefaction of the air in the respiratory tube in inspiration, and of condensation in expiration, thus increasing the respiratory action of the larynx. In tracheal stenosis this is not the case. In many cases—*e. g.*

¹ Münch. med. Woch., June 5, 1894.

² Chicago Med. Recorder, Apr., 1894.

³ Jour. of Laryngol., 1895, p. 262.

⁴ Berl. klin. Woch., No. 22, 1895.

⁵ Arch. f. Laryngol. und Rhinol., 1895, II. iii.

syphilitic tracheal stenosis—the swollen lymphatic glands lying on the trachea actually impede the movements of the respiratory tube. In dyspnea of longer duration the larynx appears lower down, nearer to the sternum, while its movements are diminished. In laryngeal stenosis the head is bent backward; in tracheal stenosis the chin is bent toward the sternum. Exceptions occur occasionally, and can be explained by the peculiarities of the individual cases. When stenosis of the respiratory tract has reached a certain degree, respiration is accompanied by a loud noise (sibilant eroupous breathing, stridor), and on placing the finger gently on the trachea a bruit will be perceived either on inspiration or on expiration, or during both. If it is only felt on expiration, the stenosis is far down in the trachea; if only on inspiration, the obstruction is laryngeal. Pulsating or even jumping motion may be communicated to the larynx by aneurysm of the aorta. Spasmodic pulsation of the trachea, described in 1887 by Olliver as an aneurysmal sign, cannot be gauged as yet in regard to its diagnostic value. It is best felt when the head is bent back and the larynx drawn down.

Paralysis of the cricothyroid muscle can be recognized by placing the finger between the thyroid and cricoid cartilages; the margins of these cartilages do not approach each other on phonation. Electric examination of the muscle will show whether the cause is central or peripheral. If the laryngeal mucous membrane is insensitive at the same time, the nerve is paralyzed, otherwise the muscle.

Incomplete paralysis of the cricothyroid appears to be a frequent source of hoarseness in catarrh. On lifting the cricoid cartilage with the thumb the voice can be improved in this case. In tracheal inflammation external pressure causes coughing. In acute laryngeal inflammation pain and coughing can sometimes be produced in the same manner. The coughing and choking can be thus induced to a notable degree in locomotor ataxia with laryngeal crises, sometimes by pressure on the cricoid; especially severe attacks may be produced by pressure in the region of the arytenoid cartilages. In bilateral abductor paralysis quick pressure on the thorax produces a brief sound (passive phonation), the vocal bands being always in the appropriate position. Finally, clonic rhythmic spasms of the vocal bands may be perceived by placing the finger gently in the region of the upper horn of the thyroid cartilage. In his lecture on disturbances of coordination in laryngeal ataxia Schroetter speaks of patients in whom the vocal bands moved spasmodically in phonation.

A New Treatment of Chronic Laryngitis is presented by Krause,¹ in whose hands surgical treatment has proved very successful in inveterate cases of obstinate laryngitis which do not yield to the usual therapeutics, such as local application of astringents, inhalations of alkaline or astringent medicaments, etc., while causing the patient great distress and disturbance of function. It was suggested by analogous methods of surgeons in persistent inflammatory or infiltrative processes that have extended to the deeper

¹ Berlin, klin. Woch., No. 16. 1894.

strata of the mucous membrane. The larynx of one patient, a singer, presented the appearance frequently seen in superannuated singers: the surface of the mucous membrane was rough and dry; the vocal bands thickened, nodulated at the margin, irregular, partly hollowed on the posterior wall, and in the vocal processes diffuse pachydermic thickening, etc.; a thick dilated blood-vessel ran over the surface of the left cord. After the ineffectual use of astringents, Krause recognized the impossibility of restoring the singing-voice without destroying the varicose vessels and shrinking the nodulated thickening of the mucous membrane. Using a spear-pointed knife, he incised the dilated blood-vessel along its whole length, and also the hyperplastic portions on both bands, alway parallel to the border of the cords, in the more thickened portions going through the whole thickness of the mucous membrane. Hemorrhage was not very considerable, and the suffusions beneath the mucous membrane subsided within a week. The voice improved and regained its former strength; the varicose vessels, and with them the discomfort in singing, disappeared. In 25 inveterate cases this method proved very satisfactory. The incisions must not be very long, in order to avoid grosser injury to the fiber of the thyroarytenoid muscle, which might lead to the formation of extensive scars. The bloodletting and the reaction following the incisions cause speedy deturgescence and regeneration of the epithelium of the mucous membrane.

Laryngitis Stridulus in Infants.—The treatment is discussed by Huchard,¹ who considers emetics, compresses of very hot water, sinapisms to the lower limbs, internal administration of ether, to be untrustworthy and inefficient, and recommends potassium bromid in large doses (for a child of four and a half years 60 to 70 grains per day). The surgical treatment is either intubation or tracheotomy.

Laryngostroboscope.—Oertel² describes a new laryngostroboscope—"a stroboscopic disk, with three rows of round openings corresponding to three octaves, placed behind a laryngoscopic reflector and rotated by means of an electric motor. Acting as a siren, its pitch can be raised in unison with the pitch of the vocal tone under study, and as it moves a little more rapidly than the vocal band vibrates, the excursion of the latter, as viewed through the laryngoscope, can be accurately observed. An astronomic magnifying lens is placed behind the laryngoscope, and when necessary a photographic apparatus can be placed behind the disk. The instrument shows that the vocal band vibrates in its entire length in producing chest tones, while in producing falsetto tones it is divided into two, three, or four aliquot parts separated by notes. In both registers the rise of the pitch is produced by increased longitudinal tension of the vocal bands. It is claimed that this instrument will be of great value in the differential diagnosis of certain parietic and paralytic conditions, especially in locating the terminal nerve-fibers and muscles involved."

¹ Jour. des Praticiens, 1894, No. 38, p. 465; ref. Am. Jour. Med. Sci., Feb., 1895.

² Münch. med. Woch., 1895, No. 11; ref. Am. Jour. Med. Sci., June, 1895.

Experimental Investigations on Phonatory Centers in the Brain.—

Felix Klemperer¹ has reached the following conclusions: As to the cortical center for the larynx, Krause demonstrated in the cortex of the dog a circumscribed region at the foot of the gyrus præfrontalis (præcruciat) which responded to electrization with closure of the glottis by adduction of both vocal cords. Semon and Horsley confirmed and amplified this result. By removing the brain, layer by layer, and electrizing the surfaces of the sections, they proved the existence of a direct communication by way of the corona radiata, the capsula interna, etc. between the cortical center and the medulla oblongata, in which they discovered a second center for the adduction of the vocal bands, also acting bilaterally. Thus the existence of a cortical laryngeal center in each hemisphere innervating both bands from either side came to be considered an assured fact. Masini in 1888, however, asserted that stimulation of Krause's center by weak currents caused the vocal band of the opposite side only to move inwardly—that the cortical center, therefore, does not act upon both sides, but upon the opposite one. Semon and Horsley, on repeating their experiments with special reference to this point, could never observe motion of but one cord. Masini insisted upon his view, in which he is confirmed by some French authors (Rauge, Garel) from clinical reasons. Onodi has since contradicted Masini.

Clinical considerations have prompted the author to make investigations, for if there exists a laryngeal center, as there is one for the facial nerve and the leg and the arm, cortical laryngeal paralysis must exist, as there are cortical paralyses of the facial nerve and the extremities. Semon shows that there is no absolutely indubitable case of cortical laryngeal paralysis on record—one in which the paralysis was seen during life by a competent observer, and in which postmortem the integrity of the peripheral nerves and of the medulla, and finally of the laryngeal muscles, had been proved.

As to the results of electrical stimulation, 20 dogs were placed under ether narcosis, and on stimulating Krause's center there was more or less adduction of the bands, and on increasing the current complete closure of the glottis; unilateral movement of a band was never brought about. The movements of the bands were isolated in but few cases; generally there was combined with them elevation of the whole larynx, moving of the epiglottis, of the palate, sometimes even contraction of the tongue. Adduction of the bands could not be induced in dogs from the cortex, but was observed in 3 cats on irritating the region described by Horsley and Semon.

As to the results of extirpation, the laryngeal centers were extirpated in one dog on one side, and in another on both. The center was first determined by means of the electrodes; then pieces of the size of a silver quarter and $\frac{1}{2}$ cm. in depth were excised. No change in regard to movement of the band or as to voice was found.

As to the experimental production of disease-foci in the laryngeal center, disease of the motor centers, not extirpation of these regions, it has

¹ Arch. Laryngol. u. Rhinol., II. iii.

been proved experimentally and clinically, produces paralysis. Krause's cortical region was inoculated with morbid agents. To produce acute abscesses typhoid bacilli were used, since they have pronounced local pyogenic effects; to obtain chronic morbid processes, tubercle-bacilli. Experiments were made on 12 dogs: twice the left laryngeal center was inoculated with typhoid-bacilli; three times with tubercle-bacilli; both centers were inoculated at the same time with typhoid-bacilli three times; with tubercle-bacilli, four times. All the inoculations were successful. Of the dogs inoculated with tuberculosis, 1 died with a solitary tubercle on one side; 1 with tubercles on both sides; 1 was still living when the paper was written; the other 4 dogs died of diffuse tuberculous meningitis or complicating suppuration. The result arrived at is, that in the dog neither acute nor chronic disease of the laryngeal center (unilateral or bilateral) produces laryngeal paralysis—that, therefore, the so-called motor laryngeal center is of no pathologic importance. The experiments on cats gave the same results.

The following are the deductions from the experiments of others and of the author: 1. In the cortex of the dog, in both hemispheres, there is a circumscribed spot (Krause) the stimulation of which causes adduction of both bands; both bands always move; even weak currents cannot produce motion on one side. In the cat there is a second spot near the one from which adduction can be produced that causes abduction (Semon and Horsley); 2. Extirpation of these portions of the cortex does not affect either the motion of the bands or phonation; 3. Disease of these portions does not cause any change in the larynx. The center is, therefore, not analogous in value to the centers of the facial nerve or of the extremities. The attempts of some authors to trace certain neuroses (hysterical aphonia, etc.), above all, spastic disturbances (spasma glottis, etc.), to cortical processes are, therefore, not founded on facts; it is not proved that they are due to processes in the spine (for instance, in the laryngeal crises of locomotor ataxy) or in the peripheral nerves.

Pachydermia Laryngis.—Fränkel¹ contributes an article upon this subject, its history, pathologic anatomy, and pathology. Virchow includes two conditions in the term pachydermia: one of these, pachydermia verrucosa, leading to the formation of tumors called papillomata by laryngologists, is not the subject of discussion here. We are dealing with pachydermia diffusa. In both kinds of pachydermia tessellated epithelium forms in large quantities. But in the second kind the changes take place in the superficial connective tissue—*i. e.* in the mucous membrane proper—producing generally more diffuse tumefactions. Fränkel is inclined to think that pachydermia diffusa begins in the connective-tissue layer of the mucous membrane, and affects the epithelium only secondarily. This appears most distinctly in microscopic sections in regions that are not exposed to external influences (especially pressure of the other side); *e. g.* Morgagni's ventricle.

¹ Arch. f. Laryngol. u. Rhinol., II. i. (XI. Internat. Med. Congress).

It appears that the hyperplastic connective tissue of the mucous membrane is responsible for the tumefaction, while the epithelium shows few or only very slight changes. The epithelium is thickened and cornified in its superficial strata, in which layers of cells with keratohyalin are found. Cornification is found not only on the vocal bands and other parts of the larynx normally covered with tessellated epithelium, but also in the cylindric epithelium of the ventricular bands and ventricle of Morgagni. The transition of cylindric into tessellated epithelium, with superficial cornification in morbid conditions, has been observed in nearly all mucous membranes. Aside from the thickening of the connective tissue of the mucous membrane and of the epithelium, important changes appear at the border of both. Papillæ are seen in the connective tissue, and the epithelium sends finger-shaped elongations into the connective tissue. The border-line, however, is always distinctly visible. Sometimes it is characterized by a basal membrane. In the elongations the regular structure of the cellular tissues (cylindric cells below, polyhedral above, etc.) is preserved. In the elongations and papillæ the border-line is shifted, but there is no mixture of epithelium and connective tissue. In the pachydermic mucous membrane changes can be shown that point to inflammatory processes. The round cells are increased in number in the subepithelial strata of the connective tissue and near the glands. Pachydermia is found in very different conditions which have in common only that they exert chronic inflammatory irritative influence upon the laryngeal mucous membrane—*i. e.* in tuberculosis, syphilis with carcinoma—but also in simple inflammatory pachydermia we must turn to those obscure factors that cause chronic catarrh and speak of catching cold, etc. Fränkel has seen pachydermia in a subacute form resulting from influenza.

Chiari¹ speaks particularly of the clinical importance and aspects and treatment of the disease. Virchow speaks of the verrucous and diffuse forms of pachydermia. The former is the papilloma of laryngologists, which term should be retained as descriptive of their characteristics as neoplasms, while diffuse pachydermia is the result of chronic inflammation. Chiari divides the latter into primary or idiopathic, and secondary, sympathetic, or accessory. Treatment varies according to the extent of the disease: 1. In whitish thickening of the bands or the interarytenoid fold, often with a bluish ground with white covering, the treatment is identical with that of chronic catarrh. 2. Singer's nodules may disappear of their own accord with care and hygiene of the voice. If not, lunar caustic or removal with delicate forceps is advised. 3. In typical pachydermia of the vocal processes the treatment of the chronic catarrh that produces it is by potassium iodid in small doses, and direct treatment of the growths only if they cause discomfort by electrolysis, the forceps, the curet, etc. 4. Verrucous prominences on the interarytenoid fold, with or without the implication of the cord or the subglottic space, with hoarseness and dyspnea, are treated by extirpa-

¹ Arch. f. Laryngol. u. Rhinol., II. i.

tion. 5. In accessory pachydermia as a result of tuberculosis, syphilis, lupus, etc. removal is advisable if there is dyspnea, dysphagia, or hoarseness. Occasionally tracheotomy has been found necessary. Syphilitic prominences prove very obstinate to medicaments.

Intubation in Diphtheric Laryngeal Stenosis.—Rabot¹ gives the results obtained in the Charity Hospital in Lyons in 1893: in 34 cases intubation was performed with 18 deaths, and 16 cases were cured. Tracheotomy and intubation were performed in 14 cases, with 11 deaths and 3 cures. In 45 only tracheotomy was performed, 26 deaths and 19 cures resulting. Rabot is convinced that intubation will in future be completely substituted for tracheotomy. Schweiger² believes that intubation can replace tracheotomy in many cases of diphtheric stenosis. He has intubated 6 children in the first year of life. Of 68 intubated children, 31 have been cured, 5 after secondary tracheotomy. According to the case, intubation may be repeated from 1 to 7 times, the tube remaining *in situ* between three and one hundred and thirty-one hours. Even if the diphtheric process is still present, the tube may be removed if the stenosis is cured. Nackerle³ reports the results obtained from intubation in the Leopoldstädter Children's Hospital in Vienna. Of 718 cases of diphtheria (from April, 1891, to July, 1893), 115 were intubated, with 48 (41.73 per cent.) cures; intubated, and tracheotomized, 48, with 11 (22.91 per cent.) cured; tracheotomized without intubation, 92, with 19 (20.65 per cent.) cured. Of all the 718 cases, 61.14 per cent. were cured. The total result shows, relatively to the former results from tracheotomy, no remarkable difference in the mortality of the disease. Seward⁴ reports a case of intubation of the larynx of unusual interest. The author intubated on four separate occasions, exclusive of simply changing the tubes. The case was one of diphtheria. The first time the tube was in five days, and had to be replaced five days later. It was expelled on the third day and left out, but had to be replaced on the second day after. It was left out one day, only to be replaced on the second after its withdrawal; it was then left in for the remainder of the illness—in all forty-seven days—being changed weekly. Differently-shaped tubes were used to prevent ulceration. Two hours before its final withdrawal 2 gr. of Dover's powder were administered to prevent spasm. This was repeated at intervals when there were any signs of spasm, and the patient ultimately did well. Gillet⁵ contributes a critical study based upon two considerable collections of statistics of intubation and tracheotomy from different modern and ancient authors. The results in tracheotomy are—in 15,995 cases, 4816 recoveries, or 30.18 per cent.; in intubation, 8299 cases, with 2486 recoveries, or 29.97 per cent. The result is nearly the same in both cases. In 769 cases of intubation secondary tracheotomy has been practised 136 times as a last resource, and has given 10 cures. Bokay⁶ discusses occlusion of O'Dwyer's

¹ Lyon médical, Feb. 27, 1894.

³ Ibid., Band xxxviii. Heft 2.

⁵ Gaz. des Hôpitaux, March 5, 1894.

² Jahrb. f. Kinderheilk., Band xxxvi. Heft 3.

⁴ N. Y. Med. Jour., March 3, 1894.

⁶ Pester med.-chir. Presse, 1894, No. 12.

tubes by pushing down the pseudomembrane, and the importance of this complication. He concludes: Pushing down of the pseudomembrane by intubation is seldom observed, and only in rare cases ends fatally. The asphyxia caused by it can be relieved by extubation, and the loosened membrane will be expectorated. If no expectoration follows extubation, artificial respiration must be performed, and if this has no effect, tracheotomy should be performed. The later obstruction of the tube by pseudomembrane rarely occurs. In such cases the obstructed tube is usually coughed out. A continual observation of the patients will prevent a fatal issue of this complication. The thread should be fixed to the child's neck, so that extubation could be performed by the nurse if necessary. O'Dwyer¹ furnishes a very interesting review of the present situation of intubation in laryngeal diphtheria, the mortality of which without treatment is put at 90 per cent., which can be reduced to from 27 per cent. to 44 per cent. of recoveries. The necessity for collecting the statistics from practised surgeons is dwelt upon. Northrup² discusses the treatment of acute laryngeal stenosis in children in what is perhaps the most complete and practical paper on the subject published during the year.

Morrison,³ while admitting that the Casselberry postural method permits food to be swallowed fairly well, insists that nurses fail to realize its importance and frequently permit the child to take its food sitting up. He therefore recommends feeding through a stomach-tube (a soft-rubber catheter to which a funnel is attached), which is lubricated and introduced into the nostril with the eyelet on the under side, as it thus offers less resistance in entering the nasopharynx. The method is also of use in postdiphtheric paralysis.

Lewinthal⁴ describes a new introducer and extractor. The introducer consists of a metallic ring which fits the end of the index finger, but leaves the finger-tip uncovered. To the ring the obturator is attached by means of a spring catch. The head of the intubation-tube has posteriorly a small stiff wire loop for the thread in introducing and for the catch-hook of the extractor. The extractor is merely a ring like the introducer, with the hook taking the place of the obturator.

Rhodes⁵ has devised a "protector" for the hand for use in intubating the larynx. It consists of a rubber glove that covers the hand from the wrist to a little beyond the metacarpophalangeal joints; on the index finger the terminal phalanx only is left uncovered.

Whitney⁶ has devised an obturator with an angle a little less than a right angle, which will render introduction easier than is the case with the O'Dwyer instrument. He prefers also the Nichols (Boston) extractor.

¹ N. Y. Med. Jour., March 10, 1894.

² Boston Med. and Surg. Jour., Feb. 7, 1895.

³ Jour. Am. Med. Assoc., June 15, 1895.

⁴ Bost. Med. and Surg. Jour., i. 129, No. 14.

⁵ Jour. of Laryngol., 1894, p. 631.

⁶ Med. Rec., June 15, 1895.

Galatti¹ reports a case of intubation in which 10 intubations, each lasting from eight to ninety-six hours, had to be done. The entire time during which the tube was worn was four hundred and thirty-six hours.

Intubation in Nondiphtheric Stenosis.—Uchermann² demonstrated a case of a woman aged thirty-five, with tuberculosis of both lungs, on whom he had performed intubation of the larynx on account of paralysis of the right posticus and of the left recurrent nerve, with swelling of both vocal bands and ulceration of the left. The immediate cause of the stenosis necessitating intubation was the circumstance that the narrowing of the glottis prevented the expectoration of a large mass of mucopurulent discharge. Four weeks later the tube was removed; the position of the vocal band was unchanged, but the tumefaction had disappeared and the respiration was quite free. Laryngeal intubation in adults was discussed at the Medical Congress at Rome by Schmiegelow.³ Intubation cannot replace tracheotomy as the principal method of treating acute stenosis in adults, but is very valuable in chronic, and particularly cicatricial, stenosis: 1. When the stenosis is slight and the passage large enough to introduce tubes, this is done after any endolaryngeal operation, removal of membrane, etc. that may be necessary. The time during which the tube may be left *in situ* varies with the case. In some intubated for one year the tube requires changing only once a month. 2. If the stricture is so great that we cannot introduce tubes large enough for respiratory purposes, the treatment becomes more complicated. We may begin (*a*) by dilating the stenosis by endolaryngeal operations, or (*b*) by introducing Schroetter's bougies, or (*c*) perform laryngofissure, remove the obstruction, and then proceed to intubate. 3. Complete obliteration of the lumen requires, first, laryngofissure, with excision of the membrane, and, secondly intubation to prevent reproduction of the diaphragm. Schmidt-huisen thought an external opening unnecessary. In 2 cases of complete closure of trachea and larynx he first pushed a sharp-pointed sound from the trachea through the cicatricial tissue. This was left *in situ* for half an hour, and then replaced by a thicker one; when the canal was sufficiently large, a laminated tent, secured by a thread attached to its lower extremity, was introduced, the thick part in the trachea and the point pushed upward by means of a small pair of forceps. After a few days solid wedges of gradually increasing thickness were inserted and retained day and night. In three weeks cannulas which could be inserted by the patient were substituted. Massei would lay stress, first, on the anatomic diagnosis, and, secondly, the etiologic, as giving the precise indications. Tracheotomy is to be preferred in carcinoma and tuberculosis; intubation is contraindicated in cicatricial stenosis (without tracheotomy), in tumors, etc. Even in syphilis, especially in some cases of perichondritis, one must use his judgment. Michael urges

¹ Wien. med. Blätter, 1894, Nos. 25 and 26.

² Med. Soc. of Christiana; ref. Jour. of Laryngol., 1894, p. 779.

³ Jour. of Laryngol., 1894, p. 239.

caution, because, in children especially, the stenosis may be removed in a natural way with the growth of the larynx. He related a pertinent case. At the 1894 meeting of the British Medical Association O'Dwyer¹ contributed his experience in the treatment of chronic stenosis of the larynx by intubation. All cases may be divided into, first, those in which intubation is performed for the twofold purpose of relieving present dyspnea, and at the same time producing gradual dilatation of the stricture, and secondly, to get rid of retaining tracheal cannulae. In cicatricial stenosis, which comes on gradually and slowly, the chief difficulty is the first introduction of a tube of sufficient caliber to admit of free respiration. In a close stricture composed of unyielding cicatricial tissue it is impossible to force even a croup-tube, and divulsion, internal or external incision, must precede intubation. In adults intubation can best be accomplished under the guidance of the mirror. So soon as the tube has been inserted as far as the short curve of the introducer permits, the mirror must be dropped, and the finger quickly inserted to carry it well home until the retaining swell has passed beyond the stricture. Considerable force is sometimes necessary at this juncture, and the finger will be found too short to follow the larynx, which recedes under the pressure. To supplement the finger in these cases O'Dwyer uses a small steel sound with a shoulder a short distance from the tip to prevent it from entering too far. Metallic tubes should not remain in the larynx continuously for more than a week, on account of a calcareous deposit that forms on the tube and causes irritation. Vulcanite tubes are therefore to be preferred whenever the lumen is large enough. For much valuable information the original paper must be consulted.

Chiari,² in an essay on intubation in nondiphtheric stenosis of the larynx, from a study of his own reported cases and the literature upon the subject, arrives at the following conclusions: Intubation is nearly indispensable, especially in little children, when removal of the tracheotomy-cannula is interfered with by granulations, inactivity-paralysis of the abductor, or spasm of the abductor muscles. In frequently recurring papilloma in children, when endolaryngeal operations are impossible, it is very useful. In foreign bodies, fractures, and tracheal compression it can rarely be resorted to; it is to be recommended in hysterical spasm of the glottis; in paralysis of the posticus muscle, of doubtful value. In acute inflammatory stenosis resulting from catarrh, phlegmon, perichondritis (especially in syphilis), tracheotomy has already been avoided in about 20 instances, but is not always indispensable. Intubation, however, can always be substituted for tracheotomy for a short time.

Tabage (with Schrotter's hard-rubber tubes) has been followed by similar success, but cannot ever be borne as long as intubation; hence the superiority of intubation in such cases.

Tracheotomy is usually to be preferred in stenosis following tuberculous processes. In chronic noninflammatory stenosis resulting from subglottic

¹ Jour. of Laryngol., 1894, p. 644.

² Wien. klin. Woch., 1894, No. 26.

infiltration or scars one may employ tubage or intubation, the latter acting more rapidly. In order to preserve the increased lumen dilatation by the patient himself afterward usually becomes necessary; and for this tubage is greatly to be preferred to intubation, because it can be learned with greater facility. Tubage is also easier than intubation.

PATHOLOGY.

By JOHN GUITÉRAS, M. D., AND DAVID RIESMAN, M. D.,
OF PHILADELPHIA.

THE CIRCULATORY SYSTEM.

The Etiology of Atheroma.—Hollis¹ says that atheroma is distinctly a local disease, affecting most frequently the aortic sinuses of Valsalva. At the point of attachment of the right posterior aortic cusp there arises a broad band of elastic fibers, which, passing upward along the greater curvature of the arch, originates a series of smaller fibers. Spreading outward, these sweep in bold outlines to the under surface of the arch, where they meet another band of fibers on the floor of the vessel. The transverse and longitudinal ridges so formed are the favorite situations for atheromatous deposits. Again, if the endothelium of an artery is examined closely it will be found to be scored by numberless fine lines, each representing a depression in the arterial intima, and functionally, no doubt, corresponding to the lines of least resistance on the skin of the palms and soles. Atheroma commences upon and follows the little ridges of endothelium between these lines. In the aortic valve the primary atheromatous deposits in the majority of cases are on the arterial surface of the cusps, between the fibrous ridges below the corpus Arantii, whence the disease spreads inward to the endocardium. Some cusps have a loose fold of endocardium at the edge of the lunule as it passes into the corpus Arantii. It is often the seat of atheromatous change. The cause of atheroma is the entrance into the blood of foreign substances, perhaps bacteria, perhaps inorganic substances in a finely divided state, as, *e. g.*, lead.

Weber² discusses the causation of arteriosclerosis, and concludes that the etiology is still obscure, and suggests that it may be due to excessive or irregular physical or mental labor, associated with the habitual ingestion of too much or too little food.

Rupture of the Aorta.—Kamen³ reports a case due to tuberculosis of the vessel-wall. The aorta had become attached to a tuberculous retromediastinal gland, and the rupture occurred from within through the sclerotic intima. A dissecting aneurysm was formed and led to sudden death.

Syphilitic Nodose Periarteritis.—Nodose periarteritis is defined by Ziegler⁴ as "a peculiar, but as yet unexplained, affection of the arteries in

¹ Jour. of Path. and Bact., Nov., 1894.

² Am. Jour. Med. Sci., Sept., 1894.

³ Ziegler's Beiträge, 1895, xvii. 2.

⁴ Lehrbuch der Path. Anat., vol. ii. p. 67.

which large numbers of whitish nodules are found upon the arterial walls. They depend upon a cellular infiltration of all the coats, with a separation and partial degeneration of the latter. Secondly, thrombosis and aneurysmal dilatation may be developed, and the process may, in severe cases, lead to inflammation of the surrounding tissues." Bruce's¹ 2 cases were as follows: The first was a male, thirty-seven; syphilitic infection occurred between two and three years before death; secondary symptoms were severe, and tertiary symptoms took place about eighteen months after the original infection; they were chiefly nervous—paralyses, some affection of speech, and diplopia. Death followed in six hours after the development of tonic and clonic convulsions, which alternated from one side of the body to the other. At the autopsy the basilar, posterior communicating, and posterior cerebral arteries were thickened irregularly, and had a whitish, soft, almost succulent-looking wall. On the vertebral arteries, near their termination in the basilar, were several external nodular thickenings. On some of the smaller branches of the basilar artery to the pons there were small, rather fusiform or rounded, swellings. The pons itself was somewhat swollen and soft. Both optic nerves were also too large and soft. The right third nerve was a little swollen, gelatinous, and pinkish. The microscopic examination of the arteries of the base of the brain showed that there was only a slight trace of obliterating endarteritis, but that, on the other hand, the adventitia was enormously thickened. This thickening was not uniform over the whole circumference; on one side it had developed so as to form a distinct node. The margins of the nodes in some sections sloped gradually into the thinner adventitia; in others the transition was abrupt. In still other sections the thickening around the vessels was more uniform. The infiltration was composed of small round and fusiform cells that were here and there aggregated into dense masses, especially round the vasa vasorum. In places there was beginning caseation. The elastic lamina was intact. Sections of the crura cerebri showed softening along each side of the artery to the nucleus of the third nerve, and the nucleus itself was entirely destroyed by softening. The vessels of the crura showed marked perivascular cellular infiltration.

The second case was a woman of thirty-five, showing on admission paralysis of the upper and lower extremities and a peculiar disturbance of speech; she answered in a slow wailing manner, in a loud tone, with frequent interruptions. Sensibility was normal, and the urine obtained by catheterism was normal. Death came rather suddenly, pyrexia and paralysis of the neck having developed just before death. The possibility of the case being one of syphilitic periarteritis was suggested before autopsy. Post-mortem, a thin, soft, gelatinous-looking exudate was found at the base of the brain and on the anterior surface of the pons and medulla. The basilar and vertebral arteries were thickened irregularly, having small, greenish-looking patches on their outer coat. There was congestion of the brain-

¹ Edinburgh Med. Jour., Oct., 1894.

cortex and of the gray matter of the basal ganglia. On microscopic study the arteries showed well-marked periarteritis of a character somewhat different from that noted in the first case. It was in part diffuse, in part nodular, the nodular appearance being due to a much greater amount of infiltration at one part of the circumference than at another. The infiltration was composed entirely of round and spindle-cells with deeply-staining nuclei. In places the cells were so densely packed as almost to deserve the name of miliary gummata. There was, however, no caseation. In the intima there was a certain degree of endarteritis obliterans. Recent thrombi were found, especially in the smaller arteries. The veins of the meninges presented almost as marked an infiltration of the adventitia as the arteries—a diffuse periphlebitis.

A study of the literature of periarteritis nodosa shows that the cases may be divided into two classes, according as they are or are not due to syphilis. The nonsyphilitic form seems to be of an infectious nature; it differs from the syphilitic in its histologic features, and also in the fact that the cerebral arteries usually escape, while in the syphilitic it is these that are alone affected. In regard to the histologic changes in syphilitic periarteritis three distinct groups may be made: 1. A uniform infiltration of the outer coat, without any marked tendency to degeneration.¹ 2. Nodular (or diffuse) cellular infiltration, with commencing caseation.² 3. Distinct gummata in the outer coat, as well as diffuse periarteritis.

Thoracic Aneurysm.—Draper³ reports 10 cases of sudden death from the rupture of thoracic aneurysm previously unrecognized. [The frequency of this occurrence is here again exemplified, and bears out the results of Biggs's investigations in New York.] We give Dr. Draper's conclusions: 1. The rupture of an aneurysm of the aorta, although it sometimes has physical exertion as its exciting cause, does not of necessity require such a cause. 2. The pericardium, more often than other cavities, receives the escaping blood; and in these cases it is not the amount of the hemorrhage that kills, but the inhibition of the heart's action by compression of the cardiac walls in a sac filled to distention with blood. 3. Deaths by aneurysmal rupture, although deserving the description "sudden," are not instantaneous; an appreciable interval, and sometimes a very considerable period, elapses between the attack and its termination. 4. A death by aneurysmal rupture is not generally a painful one, although it may leave evidences that it is so in some cases. 5. The escaping blood in an aneurysmal rupture does not always follow the line of least resistance, and sometimes it makes a devious dissection to reach an outlet. 6. Its small size and fusiform shape do not give an aneurysm immunity from sudden rupture. 7. An aortic aneurysm is not necessarily an affair of advanced life.

Rupture of the Innominate Artery from Swallowing a Foreign Body.—Atkins⁴ reports the case of a child three years old that had swal-

¹ Bruce, case i.

² Bruce, case ii.

³ Boston Med. and Surg. Jour., March 14, 1895.

⁴ Brit. Med. Jour., May 4, 1895.

lowed a halfpenny. No symptoms developed. Six weeks later the child had an attack of ulcerative stomatitis, from which it seemed to be recovering nicely when suddenly it ejected two ounces of bright-red blood in clots, and became collapsed out of proportion to the loss of blood. Under treatment it rallied somewhat, but soon after ejected four ounces of blood, and died in a few minutes. At the autopsy about three-quarters of a pint of blood were found in the stomach, and a perforation was discovered on the right side of the esophagus leading into a cavity in which a blackened halfpenny was found. A probe passed from the heart along the aorta into the innominate protruded into the same cavity about the bifurcation of the vessel.

Embolism of the Abdominal Aorta.—Jürgens¹ reports a case of this disease.

Pericarditis.—Beco² reports a case of uremic fibrinous pericarditis without microorganisms. Pure cultures of the bacillus coli were found in the spleen immediately after death.

Endocarditis.—A careful bacteriologic and histologic examination of the endocardial lesions in tuberculosis has been made by Biondi in Ziegler's laboratory.³ Nine cases were studied, and in none were there the lesions or the bacterial cause of tuberculosis demonstrable. The vegetations in all cases consisted of a hyaline thrombus, more or less transformed into new tissue. The author adopts for these cases the explanation of Ziegler, that there is a change in the endothelium of the endocardium similar to that following lesions of the intima of blood-vessels, upon which blood-clots are deposited and form the well-known hyaline thrombi. Upon these a network of fibrin is deposited enclosing red and white corpuscles. The slight alteration of the endothelium necessary for the formation of such a thrombus is readily explained in wasting diseases.

Howard⁴ reports a case of acute ulcerative endocarditis due to the bacillus diphtheriæ. Bacilli were also found in the kidney, liver, and spleen. The organism was morphologically and culturally identical with the diphtherial bacillus, but proved to be nonpathogenic to animals. There was no demonstrable infection-atrium, and the manner in which infection took place is, therefore, in doubt.

[Wright and Stokes (see page 979) also found the bacillus diphtheriæ in a case of endocarditis; it was associated with the pneumococcus.]

Rupture of the Heart.—Green⁵ reports a case of thrombosis and rupture of the right ventricle in an infant of nine and a half months. Collings⁶ reports a case of spontaneous rupture of the heart in a man of fifty-three. The laceration was in the left lateral wall of the left ventricle, and was about 1½ inches long. There was advanced fatty degeneration of the cardiac muscle.

¹ Münch. med. Woch., Oct. 23, 1894.

² Centralbl. f. Allg. Path. and Pathol. Anat., Oct. 23, 1894.

³ Ibid., Feb. 23, 1895.

⁴ Am. Jour. Med. Sci., Dec., 1894.

⁵ Brit. Med. Jour., June 1, 1895.

⁶ Lancet, April 20, 1895.

THE BLOOD.

The Pathology of Edema.—Lazarus-Barlow¹ describes a series of experiments, concerning which we have only space to give his conclusions: 1. Edema does not depend upon purely mechanic causes, even that due to cardiac disease. 2. There is no evidence that the blood-vessels are damaged in any other way than that which constitutes starvation. 3. Anemia of the tissues, meaning thereby an insufficient supply of blood and defective removal of waste-products, may lead to edema. 4. Poisoning of the tissues by waste-products is a more effective cause of edema than pure anemia. 5. Increase in the volume of the circulating fluids of the body leads to an absorption of the fluid from the blood by the tissues. 6. The processes occurring in edema have their counterpart in the normal physiologic state. 7. In both the pathologic and physiologic conditions the tissues become edematous or tend to become so, as the case may be, through the medium of an active dilatation of the arteries supplying the part. 8. The tissues of the body other than those affected are drawn upon to supply the excessive amount of fluids poured out in the region that is becoming edematous. The general conclusion is that edema is the result of an excess of the normal process whereby the nutrition of the tissues and the removal of waste-products are carried out, the process being initiated by the tissues and not by the vascular system.

The Blood in Neuroses, etc.—Reinert² determines the relation of anemia and the various neuroses. In 48 cases of hysteria the average amount of hemoglobin was 72.4 per cent.; in 36 cases of neurasthenia, 75.6 per cent.; in 6 cases of chorea minor, 72.9 per cent.; in 3 cases of epilepsy, 74.6 per cent. The increase of the red corpuscles associated with a diminished supply of oxygen is also discussed. It has been found that at high altitudes the number of red corpuscles is larger than at lower levels. Thus, Egger has found an average number of 7,000,000 red corpuscles in 10 healthy natives of Arosa (altitude 1890 m.). This must be considered as a compensatory effort on the part of the system to adapt itself to an atmosphere containing less oxygen. By bringing a larger number of red corpuscles in contact with the air in the lungs the needs of the tissues become satisfied. There is also an increase of red corpuscles above the normal in heart-disease, which is comparable in its purpose to the augmentation of the number of corpuscles at high altitudes—it favors the internal respiration, which is impaired by the disturbance in the circulation.

Barlow's Disease.—In another paper³ a careful study of a case of Barlow's disease is given. We omit the description of the autopsy, since the case was a typic one. The hemoglobin fell to between 16 and 17 per cent.; the red corpuscles to 976,000 per cubic mm.; the leukocytes numbered 12,000. A bacteriologic examination of the blood was negative.

¹ Brit. Med. Jour., March 23, 1895.² Münch. med. Woch., April 2, 1895.³ Reinert: loc. cit.

Leukocytosis.—Clinic and experimental studies of the leukocytes lead Carter¹ to draw the following conclusions: 1. Leukocytes originate in lymphoid structures, chiefly lymph-glands. They are all uninuclear at first, and as they grow may take on changes in shape and may show granules in their protoplasm, these alterations in the protoplasm being from some metabolic change. 2. Extirpation of the spleen does not cause any particular form of leukocyte to disappear from the blood; there is a leukocytosis produced from the injury to the peritoneum. 3. Digestion-leukocytosis is present after a meal of proteids or hydrocarbons, but not after a meal of carbohydrates. 4. The leukocytosis seen during the digestion of proteids is probably active in preventing autointoxication, and not solely in dealing with normal products of digestion. 5. The leukocytosis of pregnancy is by no means constant, and bears no relation to the time of gestation or the number of the pregnancy. 6. New-born children show a leukocytosis for a time. 7. Massage and cold baths produce leukocytosis—probably by hastening the circulation of fluids through the tissues and emptying the stagnant fluids of the tissues into the blood-stream. 8. Cachectic states are often attended by leukocytosis. This may be due to some special intoxication or to septic infection, or to involvement of a serous membrane by secondary growths. 9. The preagonal leukocytosis is due to some form of toxemia, and not to the method of death. 10. Posthemorrhagic leukocytosis is much greater in man than in dogs. It is marked when transfusion is practised, but may be absent without transfusion. In man it is usually present, because the tissues are more juicy than those of the dog. 11. Inflammation of serous membranes causes leukocytosis, unless the disease be of tuberculous origin. Chemic irritants produce the same effect as bacteria. 12. Sudden removal of fluid from the serous cavities causes a sudden diminution of the white blood-cells of the blood. 13. Infections show leukocytosis, with the exception of measles, typhoid fever, and tuberculosis. The most pronounced leukocytosis is seen in pneumonia and diphtheria, the degree of leukocytosis depending on the virulence of the infecting agent and the resistance of the animal economy. The extent of the local lesion in the disease has no effect on the degree of leukocytosis. 14. There is a change in the kinds of leukocytes in typhoid fever and in scarlatina, the large uninuclear forms being increased in the former and the eosinophiles in the latter. 15. Substances positively chemotactic, other than bacterial poisons, cause leukocytosis when injected into the subcutaneous connective tissue. 16. In infections the fever and the increased coagulability and altered alkalinity of the blood are insufficient to account for leukocytosis. Thermic fever does not cause an increase in the number of leukocytes, but apparently they are destroyed more rapidly. Peptone-fever causes a diminution in number. Injections of nuclein and calcium chlorid do not cause any distinct change in the number of leukocytes. 17. The cause of the leukocytosis in infections is the action of a toxic substance, whatever it may be, and not the mere presence of

¹ Univ. Med. Mag., Oct., 1894.

bacteria either in the tissues or in the blood. 18. Leukocytosis is slight—*a.* In cases terminating fatally, either because there is feeble resistance or because there is a very severe toxemia. *b.* In mild cases recovering readily. 19. Severe infections with strong resistance cause pronounced leukocytosis. 20. Following the injection of bacteria into the blood there is a transient diminution in the number of leukocytes. 21. Immunization does not cause leukocytosis. 22. The greatest leukocytosis is seen in animals that have been inoculated after they have been immunized. 23. The object of the leukocytosis in infections is probably to elaborate chemic substances that pass into solution in the juices of the body, and antagonize the action of the toxic substance causing the disease.

Gabritschewsky¹ has studied the role of the leukocytes in the diphtheric affections. His conclusions are as follows: 1. The leukocytosis in diphtheria is peculiar, and differs from that observed in other diseases. 2. Progressive leukocytosis in diphtheria gives a bad prognosis. 3. The bacilli of diphtheria in the organism are destroyed by the phagocytic activity of the leukocytes. 4. In the superficial infections, as on mucous membranes, the bacilli are removed mechanically; only a few are destroyed by phagocytes. 5. The necrotic power of the virus stops the phagocytic activity. 6. The therapeutic serum renders the cells less susceptible to the necrotic action of the diphtheria-virus.

Toxic Hypoleukocytosis.—Ewing,² by a series of careful experiments, has attempted to solve the question whether there is in leukocytosis a change in the sum-total of the leukocytes circulating in the blood. Estimations were made from the blood in the central vessels and in the peripheral veins; a microscopic examination of the internal organs was also made to locate, if possible, the lodging-place of the leukocytes found to disappear from the circulating blood after bacterial injection. The experiments of Schulz³ were in the main repeated. Some of the animals (rabbits) were killed by breaking up the medulla; the abdomen was rapidly opened, and five or six specimens of blood were drawn, by as many "mixers," from the central vessels. The leukocytes were estimated with the Thoma-Zeiss erythrocytometer. The order of the experiments was as follows: First, the normal number of leukocytes in the central vessels was determined in rabbits killed by breaking up the medulla. Then the same vessels were examined, at intervals of from five minutes to two hours, after injecting into the middle ear-vein 0.5 to 1.5 c.c. of a three-weeks-old broth-culture of *Bacillus pyocyaneus*. The injection of this was found to reduce the number of leukocytes in the opposite ear-vein progressively for at least three hours. The same experiments were performed on rabbits anesthetized with ether. The author's conclusions are as follows: 1. Within eight minutes after rupture of the medulla in rabbits very little change occurs in the number of leukocytes in the blood of the central vessels. 2. Ether-narcosis in rabbits has very little effect on the location of leukocytes

¹ Annal. de l'Inst. Pasteur, Oct., 1894.

² N. Y. Med. Jour., March 2, 1895.

³ Arch. f. klin. Med., Nos. 2 and 3, 1893.

in the circulating blood. 3. The view of Rieder and Schulz, that no change in the sum-total of leukocytes in the blood ever occurs in leukocytosis, is incorrect, and may be disproved by examination of rabbits' blood in the stage of hypoleukocytosis, either after rupture of the medulla or, more conclusively, in ether-narcosis. 4. After intravenous injection of certain bacteria and their products the majority of the leukocytes, especially the multinuclear forms, disappear uniformly from all parts of the arterial and venous circulation. 5. The leukocytes that disappear after bacterial injections are to be found more or less stationary in the capillary vessels, especially in the lungs and liver. 6. The appearance of the endothelial cells of the hepatic capillaries indicates that these cells may take more than a passive part in detaining the leukocytes within that organ. 7. Leukocytolysis is apparently a secondary and unessential factor in the production of hypoleukocytosis. 8. It remains an open question whether hypoleukocytosis depends upon a simple mechanic sifting of swollen and cohesive leukocytes by the capillary endothelium, or upon a determination of these leukocytes, by chemotactic influence, to specialized capillary endothelium in the viscera. 9. The appearance of the hepatic capillary endothelial cells, both before and after the injection of bacteria, points to a possible function of the liver as the physiologic scavenger of the body, and, in pathologic conditions, as a special organ of phagocytosis.

Billings¹ examined the blood of cases of malaria during the febrile and afebrile periods with a view of determining the changes in the number of leukocytes under these conditions. He found during the fever that diminution in the number of leukocytes is marked, while the greatest number appeared two or three hours after the chill. Then follows a progressive fall in the number until the end of the attack. After this the number rises, and stands during the interval at a mean between the maximum and minimum number. There is a relative and absolute increase in the number of uninnuclear elements. No definite conclusions were drawn regarding the autumnal type of the fever, the present observations relating to the tertian variety seen in the spring.

Alkalinity of the Blood.—Fodor² reports the results of experiments upon animals with a view of determining the influence of the alkalinity of the blood upon diseases of microorganismal origin. The resistance against infection by cultures of anthrax-bacillus is greatly augmented when the alkalinity of the blood is increased by the administration of sodium bicarbonate. The alkalinity of the blood in animals infected by certain bacilli first increases, then diminishes. When death occurs the alkalinity decreases progressively and markedly, but if the infection is not fatal the diminution is insignificant, and is followed by an increase. Rabbits in which either the blood is more highly alkaline or the alkalinity increases under infection, offer greater resistance to anthrax-bacilli than those rabbits the blood of which is only slightly

¹ Johns Hopkins Hosp. Bulletin, No. 42, Oct., 1894.

² Centralbl. f. Bakt. u. Parasitenk., Feb. 28, 1895.

alkaline. [It would seem, therefore, that the degree of alkalinity of the blood, and the power of increasing it, is an important factor in the immunity against infectious diseases.]

Pernicious Anemia.—Hopkins¹ reports 5 cases, in 4 of which the quantity of iron was estimated in the viscera and found to be as follows:

	Case 1.	Case 3.	Case 4.	Case 5.
Liver (normal, about 0.09)	1.038	0.209	0.400	0.190
Spleen (normal, about 0.18)	0.301	0.325	(Not determined).	

In all of the cases a reaction for iron with acidified potassium-ferrocyanid solution was obtained, most strikingly in Cases 1 and 5. Careful analyses were made of the urine during life, and dealt especially with the pigments, the sulphur-compounds, the uric-acid ratio, the iron in the urine, and a proteolytic ferment. The results are summed up as follows: 1. The band-yielding pigment in the urine of pernicious anemia is normal urobilin. 2. The occasional presence of small quantities of hematoporphyrin may cause the urobilin extracts to show a three-banded spectrum, and thus to simulate the presence of a special form of pigment. 3. The "pathologic urobilin" described in other forms of disease is in all probability a mixture of like kind. 4. The amount of urobilin present in pernicious anemia, though in excess of the normal average, is not greater than may be found in concentrated normal urines, which in the fresh state exhibit no absorption-band at F. The presence of the band in this disease would, therefore, seem to depend upon the condition of the pigment, as well as on its quantity. 5. The ethereal sulphates are increased in amount. 6. The quantity of unoxidized sulphur-compounds seems to be decreased in the urine, and it may be suggested that these are stored up in the liver in association with the liberated iron. 7. The uric-acid ratio, though it departs from the normal, is not affected in any constant manner. 8. The excretion of iron by the kidneys is intermittent, and the amount in the urine may differ greatly on different occasions. 9. In one case the urine contained a proteolytic ferment, active in alkaline solutions. 10. A complete analysis on one occasion showed a great relative decrease in the lime and magnesia, and also in the phosphates, in the urine.

DISEASES OF THE DIGESTIVE TRACT.

Angina Ludovici.—Lockwood² reports 2 cases, one, a male of twenty-eight years, in whom there were found after death long bacilli in the kidney, in the pulmonary veins, and in pneumonic patches; capsulated diplococci were also found. In the tissues of the floor of the mouth the staphylococcus aureus, streptococcus, a diplococcus, and certain bacilli were found. The bacillus in the tissues did not stain by Gram's method, and was only brought out by soaking the section for many days in Czinkinski's solution. The

¹ Guy's Hospital Rep., 1., 1893.

² Lancet, London, March 23, 1895.

bacillus was anaerobic, actively motile, gas-producing, and without spores. It was probably the bacillus septicus or the bacillus œdematis maligni of Pasteur and Koch.

Retropharyngeal Abscess.—Koplik¹ has studied 60 cases of this affection bacteriologically. The pus was obtained in three ways: through an incision by way of the mouth, by aspiration through the mouth, and by a lateral opening in the neck. Careful antiseptic precautions were taken, but even then the first method did not prove free from objection. Sterilized test-tubes were used to receive the pus. A streptococcus was invariably found by cultivation—in one case, probably as an accidental contamination, the bacterium lactis aërogenes. Four varieties of streptococci could be distinguished, which the writer designates as long streptococcus *a* of the pharynx, long streptococcus *b*, short streptococcus *a*, and short streptococcus *b*. All produced after a time an acid reaction in bouillon. No marked effect followed the injection of each species into rabbits and mice, whence the author concludes that the streptococci have but slight virulence, two especially, long *b* and short *b*, being nonpathogenic.

Peptic Ulceration of the Esophagus.—Guitéras² reports a case of peptic ulceration of the esophagus, with perforation during life, occurring in a single woman of forty-four. For a number of years she had suffered from attacks of dysphagia and vomiting, which were on several occasions temporarily relieved by the passing of an esophageal bougie. The last attack began seven weeks before her entrance into the hospital. She was unable to swallow any food, but had no pain. A bougie was readily passed, but had no permanent result. After the application of electricity to the neck she took liquid nourishment without difficulty, but continued to fail. Postmortem, a very interesting condition was found to exist in the esophagus. About 4½ in. below the cricoid cartilage the mucous membrane of the gullet began to present a worm-eaten appearance, being riddled with numerous ulcers; the largest were about the circumference of peas, the smaller, of pin-heads. The ulcerative process affected especially the lateral walls. Opposite the bifurcation of the trachea were two larger and perforating ulcers, apparently resulting from the coalescence of smaller ones. Below these the ulcerative process continued down to the cardiac orifice. Besides the ulcers, which varied in depth, there were patches of pigmentation, apparently the remains of healed ulcers. Owing to imperfect preservation, the tissues were not in a first-class condition for microscopic study, but the most marked changes that could be seen were anemia of the tissues, disaggregation of the tissue-elements, the absence of extensive areas of inflammation, and the presence in all the layers of the esophagus of large numbers of plasma-cells. The edges of the ulcers showed very little evidence of inflammatory reaction, though there was some.

The author believes that the ulcers were of peptic origin, and considers

¹ Centralbl. f. Bakteriöl. und Parasitenk., Sept. 26, 1894.

² Internat. Med. Magazine, Nov., 1894.

that hysteric ischemia was the cause of the want of resistance of the mucous membrane. This, together with a certain degree of merycism in the patient, as shown by her ability to regurgitate food at will, explains satisfactorily the rare lesion. In addition to the ulcers of the esophagus the patient had a right-sided croupous pneumonia, the starting-point of which seemed to have been one of the perforated ulcers, which corresponded in position with an area of softening in the pneumonic lung.

Varicose Veins of the Esophagus.—Von Nottthafft¹ reports the case of a man aged eighty-four who died suddenly under the symptoms of internal hemorrhage. At the autopsy a ruptured varicose vein was found in the lower part of the esophagus and a large quantity of blood in the stomach and small intestines. The esophagus was the seat of a spindle-cell sarcoma near the point opposite the bifurcation of the trachea. There was also cirrhosis of the liver, to which the author ascribes the varicose veins of the esophagus.

Gastric Disease.—Oppler² has made studies in the microscopy of the gastric contents in diseases of the stomach. He finds that microorganisms are seldom entirely absent from the stomach-contents, but, excluding yeast-cells and sarcinae, it is only in carcinoma that they so abound as to make all other elements of secondary importance. The author found in these cases a special kind of slender bacillus that groups itself in chains and at times in dense masses. Although probably a saprophyte, it could not be cultivated artificially. The growth of the organism was most abundant in cases of carcinoma in which HCl was absent and the motility was impaired—cases in which lactic acid is usually produced. In cases in which there was retention of the stomach-contents from nonmalignant stenosis or from gastrectasia the organisms were not found. In such cases yeast-cells and bacteria were noted, but they were in small numbers in the cases in which the rods described were present. Contrary to the teaching of text-books, the author was not able to find sarcinae in cases of gastric carcinoma, and even when sarcina ventriculi was introduced in pure cultures into the stomach, it could not be demonstrated, either by the microscope or culturally, twenty-four hours later. The characteristic features of the stomach-contents in gastric carcinoma are summed up as follows: 1. In cases in which the motility is good—in carcinoma of the walls and curvatures—free HCl is often absent, lactic acid is present in a few cases, and occasionally tumor-particles and bacteria in large numbers are found, but never sarcinae. 2. In cases in which the motility is greatly diminished—(a) where free HCl is still present—cases of beginning carcinoma at the pylorus: sarcinae, and occasionally tumor-particles, are found, but lactic acid and the rod-shaped bacteria described are absent; (b) when free HCl is absent—in carcinoma of the pylorus, curvatures, or walls, all in advanced stages: large amounts of lactic acid are produced, and chains of the slender bacteria are present in great abundance; occasionally also tumor-particles, etc., and there may be a tendency to the

¹ Münch. med. Woch., April 9, 1895.

² Deutsch. med. Woch., 1895, p. 73.

formation of gas, but sarcinæ are always absent. Cases under 2a may be, and those under 1 are often, transformed into those coming under 2b.

Sarcina Ventriculi.—The same author¹ has carefully studied the sarcinæ ventriculi contained in the gastric contents in cases of dilatation of the stomach, and was able to isolate five different species, the main characters of which we give below :

I. *Sulphur-yellow Sarcina.*—The individuals have the size of the typic sarcina ventriculi, and occur in the form of compact, bale-like masses. On gelatin-plates irregular, grayish-yellow, homogeneous masses appear on the third day, and become yellow by the fifth day. On the sixth day liquefaction begins, which progresses until at the end of two weeks the colonies swim in a funnel of liquid about 1 cm. in diameter. In gelatin-puncture the growth is slow, and takes place only in the upper portions of the stab; there is liquefaction on the third or fourth day. The growth sinks to the bottom, leaving the supernatant gelatin perfectly clear. On agar-plate the presence of irregular yellow points is noticeable in twenty-four hours in the depth of the medium, and superficially, larger, bright-yellow colonies. Growth continues until the colonies have a diameter of 3 or 4 mm., and are curiously marked, resembling the web of a spider. In agar-puncture there is active growth in twenty-four hours. In bouillon there is luxuriant growth in twenty-four hours; a sulphur-yellow sediment forms, while the supernatant liquid remains clear. In hay-infusion the growth is similar to that in bouillon, but even more luxuriant; the packages attain a colossal size. All media contained 2 per cent. glucose. On potato there was feeble growth.

II. *Greenish-yellow Sarcina.*—Morphologically this resembles No. I. On gelatin-plate there are on the second day yellowish points, increasing in size, and beginning to liquefy by the sixth day. The superficial colonies show a radiate or punctate margin. In gelatin-puncture the growth is limited to the surface and upper strata. There is funnel-shaped liquefaction, beginning on the sixth day; the growth sinks to the bottom, the liquid becoming clear. On agar-plate there are yellowish-white points in twenty-four hours, gradually increasing in size. In agar-puncture there are distinct round colonies which eventually coalesce. In bouillon and hay-infusion there is an active growth in twenty-four hours, and in two days a thick yellow sediment. On potato the growth is as in No. I.

III. *White Sarcina.*—The individuals are only half the size of the previous forms; the packages are less compact, and not so flattened at the points of contact. On gelatin-plate there are on the fifth day minute whitish-yellow points, which slowly enlarge. Liquefaction occurs late—in two and a half or three weeks. In gelatin-puncture there is slow growth, confined to the surface; the culture is whitish-yellow. Slow liquefaction begins in the third week, the gelatin remaining turbid for several months. On agar-plate deeply-seated, irregular white points become visible in twenty-four hours; on the surface the colonies have a porcelain-like appearance. In agar-

¹ Münch. med. Woch., July 17, 1894.

puncture there is active development in twenty-four hours. In bouillon there is abundant growth in twenty-four hours, a thick sediment and mycoderma; the fluid remains quite clear. In hay-infusion the development is similar, but more luxuriant. On potato there is a thin, moist, whitish pellicle.

IV. *White, Nonliquefying Sarcina*.—This species presents the same characteristics of growth as the preceding, but does not liquefy gelatin. The individuals are a little larger than those of No. III.

V. *Orange-yellow Sarcina*.—The form and size are exactly as in the liquefying white sarcina. On gelatin-plates small points are visible on the fourth day, which microscopically are composed of circular, coarse-grained, grayish-yellow colonies. After the sixth day the color is orange-yellow, and gradually deepens. In gelatin-puncture the growth is slow and limited to the surface and upper parts of gelatin, the culture projecting somewhat above the surface, giving the appearance of a nail. Liquefaction is very slight. On agar-plate small, irregular, whitish points are found in twenty-four hours; on the seventh day the color becomes orange-yellow. In agar-puncture growth occurs in twenty-four hours, composed of small orange-yellow colonies. In bouillon and hay-infusion there is in twenty-four hours abundant development; a flocculent sediment forms, the liquid itself remaining clear.

The frequency with which the different forms occur is variable. Species I. and III. are common; II. and IV., rarer; and V. was only found in two cases. Species I.–IV. were exceedingly sensitive to acid reaction of the medium, while the orange-yellow sarcina grew more actively in an acid than in an alkaline medium. The factors that enable the sarcina to live in the acid contents of the stomach are as yet entirely unknown. The alkaline reaction of the medium is in time changed by the sarcina to an acid one; the nature of the acid has not been determined.

[As noted on page 935, Oppler has pointed out the fact that sarcinae are exceedingly rare in carcinoma ventriculi. He found them only twice, in both cases associated with the presence of hydrochloric acid in the gastric juice. In one of the cases the disappearance of the acid coincided with that of the sarcinae, the latter giving place to the long rod-shaped bacteria described in the preceding paragraph.]

Gastric Fermentation.—A contribution to the bacteriology of gastric fermentation is made by Kaufmann.¹ The important point brought out is that fermentation can take place even in the presence of large quantities of free hydrochloric acid. In a neurasthenic patient suffering from atony of the stomach, with increased secretion of hydrochloric acid, the author found a large number of microorganisms in the gastric juice, among them a bacillus resembling the bacillus coli communis.

Acute Parenchymatous Gastritis.—Hayem² states that this is a process beginning in the glandular elements, and in the pure form is unaccompanied by

¹ Berlin. klin. Woch., Feb. 11, 1895.

² Sem. méd., Oct. 27, 1894.

any leukocytic infiltration. The cardiac portion of the stomach is first affected, the lesion thence spreading to the pyloric, with the result that the latter becomes completely changed, and finally is indistinguishable from the cardiac end. He maintains that there are no special cells for the secretion of hydrochloric acid, in support of this pointing out that the parietal cells are well developed in the stomach of the new-born, although digestion is carried on in the absence of hydrochloric acid; and, further, that he has not been able to demonstrate an increase in the parietal cells in the adult stomach in cases of hypersecretion of this acid. The increase in the amount of acid seemed to correspond with the transformation of the pyloric into peptic glands; that is, with a change of the pyloric alkaline secretion into an acid one. No interest is attached by the author to the question of the absence or presence of hydrochloric acid in carcinoma. The state of digestion depends in carcinoma, as in other gastric diseases, on the condition of the mucous membrane. Carcinoma develops most frequently in hypopeptic or apeptic cases—cases in which free HCl is absent—while histologic examination of the stomach shows atrophic gastritis. In the rare cases of carcinoma in which a hyperpeptic condition is present one would expect to find a different anatomic condition, and in such a case Lion is quoted as having found parenchymatous gastritis. Gastric ulcer, on the other hand, is most frequent in hyperpeptic cases, and the dominant structural lesion is a form of gastritis more or less parenchymatous in character. [It appears that the facts brought forward by Hayem do not diminish the importance of the examination of the gastric contents for HCl in cases suspected of carcinoma.]

Carcinoma of the Stomach.—Riesman¹ reports a case of carcinoma of the pyloric end of the stomach associated with the presence of a pediculated tumor of the peritoneum and gall-stones. The peritoneal growth hung by a long pedicle from the peritoneum of the transverse colon. It was a lipoma in which the blood-vessels had undergone telangiectatic change; therefore, an angioliipoma. The tumor was analogous to the free bodies at times found in the serous cavities, which in the majority of cases were probably at one time attached. The writer adopts the theory of Virchow and Rokitansky for the explanation of this tumor, believing that it arose as a lipoma within the subserous connective tissue, and, gradually pushing the peritoneum before it, finally became pediculated. Although there were numerous metastatic carcinomatous deposits in the lymphatic glands of the abdomen, the liver escaped entirely.

Intestinal Topography.—Of great importance, both to the surgeon and the physician, are the topographic studies which Curschmann² has made on the position, form, and size of the large intestine, and their clinic significance.

In regard to the cecum and ascending colon, which are considered together, anomalies in position are very frequent, and are associated with the formation of a true mesentery. The latter may be so long that the cecum and ascending colon lie far removed from their normal site, and are

¹ Univ. Med. Mag., April, 1895.

² Deutsch. Arch. f. klin. Med., June 26, 1894.

surrounded by small intestine or lie concealed in the middle of the abdomen. The formation of loops is comparatively rare in the ascending colon; volvulus is next to unknown, the author having observed but a single instance; another is reported by Treves. In rare cases there is, in addition to the development of a mesentery, an abnormal attachment of the ascending colon to the abdominal wall, corresponding to that existing at a certain period of embryonic life. In such cases the cecum and ascending colon float freely in the umbilical region or even to the left of it. As a rule, this anomaly is



FIG. 1.—Displacement of the cecum and appendix toward the middle of the abdominal cavity. The mesocolon is unusually long (Deutsch. Arch. f. klin. Med., June 26, 1894).

accompanied by disturbances in the position of the other parts of the intestines (Fig. 1).

More important than changes in the ascending colon are those in the position and form of the cecum. There is, first, the congenital, or, rarely, acquired, elongation of the cecum, which according to some writers predisposes to ileus (Treves, Leichtenstern, Eichhorst), although the author has himself not observed an example. He has, however, often noted a kinking and bending over of such an elongated cecum. In such cases the cecum is frequently turned upward toward the diaphragm and covers a corresponding portion of the ascending colon. In 2 cases complete obliteration of the lumen of the bowel was produced, the patients dying with the symptoms of ileus (Fig. 2).

This doubling of the cecum can produce extreme difficulties in the diag-

nosis of appendicitis. If a patient with this anomaly is attacked with typhlitis or perityphlitis, the seat of the pain, as well as the location of any exudate, will be in unusual positions. An interesting case illustrating this point is cited. The patient, a man of thirty-three, after an indiscretion in diet,

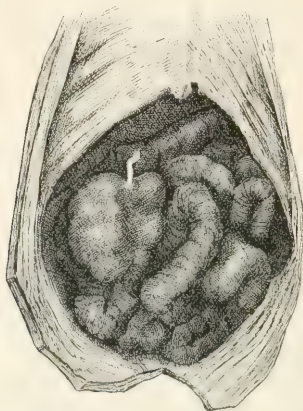


FIG. 2.—Upward displacement of the cecum and appendix (*Deutsch. Arch. f. klin. Med.*, June 26, 1894).

and after having suffered for some time with constipation, was seized with pain in the right side below the costal margin. There were vomiting, fever, and a continuance of constipation. Close to the right costal border a firm, painful adherent tumor, about the size of a hand, could be felt; below it, in the right iliac fossa, a tympanitic note. The patient died of general peritonitis. The autopsy revealed general purulent peritonitis, and in the right upper quadrant of the abdomen a cavity separated from the general peritoneal cavity and containing dirty-yellow pus. In the bottom of the cavity the thickened and adherent appendix was seen, its apex touching the edge of the ribs. Its extreme end contained a cherry-seed sized fecal concretion, the wall about which was perforated in several places. The peculiar position of the appendix was shown to be due to a doubling upward of the cecum in front of the ascending colon, its blind end touching the margin of the liver. In the lower part of the abscess-wall there was a tear $2\frac{1}{2}$ cm. long, through which the cavity communicated with the peritoneum.

Another important anomaly is the congenital shortening or absence of the ascending colon, a condition associated with displacement of the cecum and appendix, which may be situated close against the margin of the liver or even behind that organ. In one case a perityphlitis of such a misplaced appendix led to pain in the region of the liver and to jaundice, and the diagnosis of gall-stones was made (Fig. 3).

In the transverse colon and its flexures departures from the normal are

common. Not rarely, as a rule in connection with a shortened colon, one or both flexures may be absent. If the right flexure is absent, the ascending colon passes diagonally across to the left side; the analogous condition in the descending colon is produced by absence of the splenic flexure. Of import-

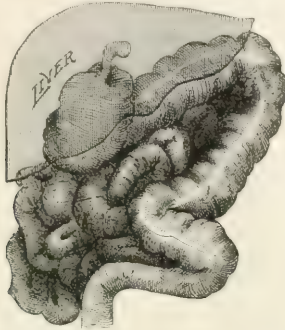


FIG. 3.—Doubling of the cecum upon itself, whereby it was caused to lie behind the right lobe of the liver, to which it was also adherent. The outlines of the liver have been added to show the relations (Deutsch. Arch. f. klin. Med., June 26, 1894).

ance from the standpoint of diagnosis is the existence of a loop in the transverse colon, which rises in front of and overlies the entire anterior surface of the liver. In such cases the normal anterior dulness of the liver is permanently replaced by a tympanitic note. The presence of a normal area of hepatic dulness in the axillary line and posteriorly shows that the liver is not diminished in size, but is only covered by the colon. No disturbance is caused by the anomaly, but it can complicate diagnosis. Enlargement of the flexures with doubling is most common on the left side, and can obscure the splenic dulness. Torsion is less common in the flexures and transverse colon than elsewhere in the large intestine, probably because the limbs of the loops are usually more widely separated than in the sigmoid flexure. Anomalies in the organs related to the flexures of the transverse colon, particularly in the stomach, are common. The left kidney has been found dislocated as the result of traction by adhesions to the splenic flexure.

The descending colon and sigmoid flexure are the most common seats of anomalies of position. In quite a number of cases the sigmoid flexure is unusually long and presents large loops, a relic of its fetal condition. This looping is generally associated with an unusual length of the colon—in 15 cases the colon was from 195 to 280 cm. long, as against an average normal length of 142 cm.

Another important anomaly is a loop between the lower end of the sigmoid and the upper end of the rectum, which is usually combined with an entrance of the colon into the right side of the pelvis. Through this the cecum and this loop of bowel are brought into close relation, and sometimes are united

by adhesions in the region of the right iliac fossa. As to the position of the large loop in the sigmoid flexure, it is, as a rule, situated in the median line, parallel to and just behind the linea alba, its apex touching the transverse colon, and in some cases even reaching to the diaphragm and covering the left lobe of the liver and the stomach. The base of the loop is usually covered by small intestine—an important point in volvulus, as in such cases the existence of parts of the small bowel can be demonstrated in the left iliac fossa or entire left side, and will also first present themselves when the abdomen is opened.

In regard to the causes of volvulus, the author thinks that an excessive length of the sigmoid flexure and a close approximation at the base of the two limbs of the loop are the most important factors.

The constipation which is so frequent in cases of enlarged sigmoid depends, at least in part, on two factors—the form of the loop and the lessened effect of the abdominal press, and the greater concentration of the feces which is the result of the longer time required for their passage. The author suggests that as patients who have had volvulus are in constant danger of relapse, it is advisable, at the time of operation, to resect the loop of sigmoid, which will also facilitate the reposition of the intestines into the abdominal cavity.

The second part of the paper is devoted to a consideration of the relations of the posterior abdominal wall and the retroperitoneal connective tissue to the peritoneal and pleural cavities. As to paratyphlitis and the retroperitoneal space, it is to be noted that paratyphlitic [not to be confounded with perityphlitic] exudates remain rarely circumscribed to the iliac fossa, but extend up toward the region of the liver, and even behind the kidney, and point generally in the lumbar region, just below the twelfth rib. The exudate follows the direction of the ascending colon and stops at the hepatic flexure. Primarily it makes its way between the layers of the mesocolon, separates these, and spreads unrestrainedly in the retroperitoneal tissue. Sanguineous effusions follow the same course as purulent exudates. The tendency on the part of the effusions to extend upward is favored by gravity, as in the recumbent position the iliac fossa is the highest point of the abdomen.

As to the relation of the retroperitoneal tissue to the pleural cavity, it is known that there is a close connection between these two, as is shown clinically by participation of the pleura in purulent processes affecting the retroperitoneal space. The extension from the latter through the diaphragm to the pleura is made possible by the existence of a *locus minoris resistentie*. This is a triangular space situated between the outer and inner crura, filled in chiefly by connective tissue traversed by a few thin muscle-fibers. Immediately above it is the pleura. Anteriorly the space is covered by the upper portion of the kidney. The author cites cases of empyema following retroperitoneal abscess, and refers to two instances in which an empyema penetrated through the triangular spot into the retroperitoneal tissue.

Membranous Colitis.—Pichevin¹ comes to the following conclusions in regard to the pathogenesis: The disease depends primarily upon an atony of the intestines. Under the influence of obscure causes the toxins secreted by certain bacteria, perhaps a colon-bacillus, penetrate into the blood and produce the changes in the intestinal canal that manifest themselves in the formation of false membranes. The toxins probably give rise to a hypersecretion, to coagulation of the mucus, and to desquamation of the epithelium. The membranes consist of mucin and globulin.

Relations of the Amœba Coli to Dysentery.—Kovács² comes to the following conclusions: 1. The amœba coli of Lösch is an intestinal parasite successfully obtained in pure culture and inoculated into animals. 2. It is doubtful whether all observers have studied the same amœba. 3. The amœba coli is pathogenic and capable of producing enteritis by its presence. Ulceration may, but need not, accompany the enteritis, the amœba appearing in the ulcer. It has not been determined that the amœba itself is capable of producing severe lesions in the mucous membrane. If, however, the mucosa is already diseased and allows the amœba to enter the tissues, reparative processes are very much retarded. 4. The amœba coli holds a close relation to hepatic abscess and other sequelæ of dysentery. 5. The appearance of the intestinal lesions is variable.

Harris³ was able to observe multiplication of the amœba dysenteriae in the fecal discharges of a case of relapsing dysentery. The division was direct, usually into two organisms, but in one instance triple division was noted.

Sarcoma of the Small Intestine.—Stern⁴ reports a primary sarcoma of the small intestine in a new-born child that died four days after birth from bowel-obstruction.

Enteroliths.—Ott⁵ says enteroliths are formed in a similar manner to the other concretions in the human body. A nucleus is formed from small fecal particles, foreign bodies, and sometimes the remains of undigested food, or substances such as chalk, magnesia, or bismuth subnitrate. These grow and distend the intestine. The intestinal atony usually present favors their development. They occur more frequently in women, perhaps on account of the tendency to habitual constipation in that sex.

Ulcers of the Digestive Tract.—Kelynaek⁶ examined 3471 postmortem records made in the Manchester Royal Infirmary, and found that out of 157 cases of acute peritonitis a comparatively small number was due to perforation of gastric and other abdominal ulcers; 9 were due to perforative appendicitis. He divides ulcers of the alimentary canal into gastric, pyloric, and duodenal. Since 1867 only 10 cases of primary duodenal ulcer are reported, of which number 6 died from acute intraperitoneal perforation. The remaining 4 died of hemorrhage. All these cases were in males.

¹ Jour. de Méd. de Paris, March 30, 1895.

³ Med. News, Nov. 24, 1894.

⁵ Prag. med. Woch., April 12, 1894.

² Zeitschrift f. Heilkunde, Bd. xiii.

⁴ Berlin. klin. Woch., Aug. 27, 1894.

⁶ Brit. Med. Jour., Oct. 27, 1894.

[We would call attention to the valuable paper of Perry and Shaw,¹ who found 70 instances of duodenal ulcer, open and healed, in a series of 17,652 autopsies (0.4 per cent.). Of these, 52 had occurred in males, 18 in females—a ratio of 3 to 1.]

Meckel's Diverticulum.—Richardson² reports an example of an unusually large Meckel's diverticulum, which sprang from the ileum about 3 feet above the ileocecal valve, and was attached at its distal end to the umbilicus. There was no true mesentery. It was covered by peritoneum, and was supplied with blood-vessels from the ileum and from the abdominal wall. The caliber of the diverticulum was that of the ileum, with which it communicated freely.

Chylous Ascites.—Weiss³ relates a case in a man of thirty-six. Two months before death the abdomen began to swell, and, other treatment failing, paracentesis was performed. The fluid contained red corpuscles and many white cells about the size of leukocytes and filled with numerous granules. The specific gravity of the fluid was 1017; it contained albumin, neutral fat, and the salts of blood-serum. The necropsy revealed the presence of a carcinoma of the stomach, with secondary deposits in the retroperitoneal and mesenteric glands, that compressed the thoracic duct at its lowest part and the receptaculum chyli. The lymph-vessels of the intestine and diaphragm were infiltrated.

Hemorrhagic Pancreatitis with Fat-necrosis.—Cutler⁴ reports two cases, the first in a woman of fifty-eight with a history of severe attacks of indigestion extending over many years. During the last illness there were jaundice, distention of the abdomen, vomiting, fever, and great prostration. The urine contained albumin and bile, but no sugar. Toward the end pain in the epigastrium, with tenderness, became very marked. At the autopsy there was found a bloody fluid in the abdominal cavity, with peritonitis, fat-necrosis, chiefly about the region of the pancreas, and an enlarged pancreas, surrounded and infiltrated with blood in its middle portion. Gall-stones were found in the gall-bladder, the common and cystic ducts.

The second case was that of a woman of fifty-two, who had had stomach-trouble for five years; she had been an alcoholic. On admission to the hospital there was tenderness over the epigastric and umbilical regions, and edema of the abdominal and thoracic walls. The urine contained albumin and sugar, much indican, and gave the diazoreaction. At the autopsy acute hemorrhagic pancreatitis and disseminated fat-necrosis were found.

DISEASES OF THE LIVER.

Regeneration of the Liver.—Ponfick⁵ has studied the regeneration of the liver after the removal of from two-thirds to three-fourths of the organ. Dogs and rabbits were used in his experiments, and the animals killed at

¹ Guy's Hospital Reports, 1893, vol. I. p. 171.

² Quart. Med. Jour., April, 1895.

³ Centralbl. f. Innere Med., July 21, 1894.

⁴ Boston Med. and Surg. Jour., April 11, 1895.

⁵ Virchow's Archiv, Bd. cxxxviii., 1895.



FIG. 1. Areas from the liver of a rabbit from which three-quarters of the organ had been removed twenty days previously; active regeneration of the gland cells; the more compact and darker groups are new cells, the smaller and paler are the old cells. Hardening in Muller's fluid, staining with hematoxylin. (Hartnack 7.)

FIG. 2. Section from the center of an hepatic lobule from a rabbit which eight days previously had been deprived of three-quarters of the liver: *a*, hepatic vein; intralobular; *b*, capillary with numerous large nuclei, surrounded by *c*, dilated lymphatic; *d*, resting liver cells, several with two nuclei; *e*, young cells. Hardened in Flemming's solution, stained with hematoxylin. Zeiss homogeneous immersion, apochromatic 2mm., compensating ocular 6. (Virehow's Archiv, Bd. CXXXIII, 1896.)

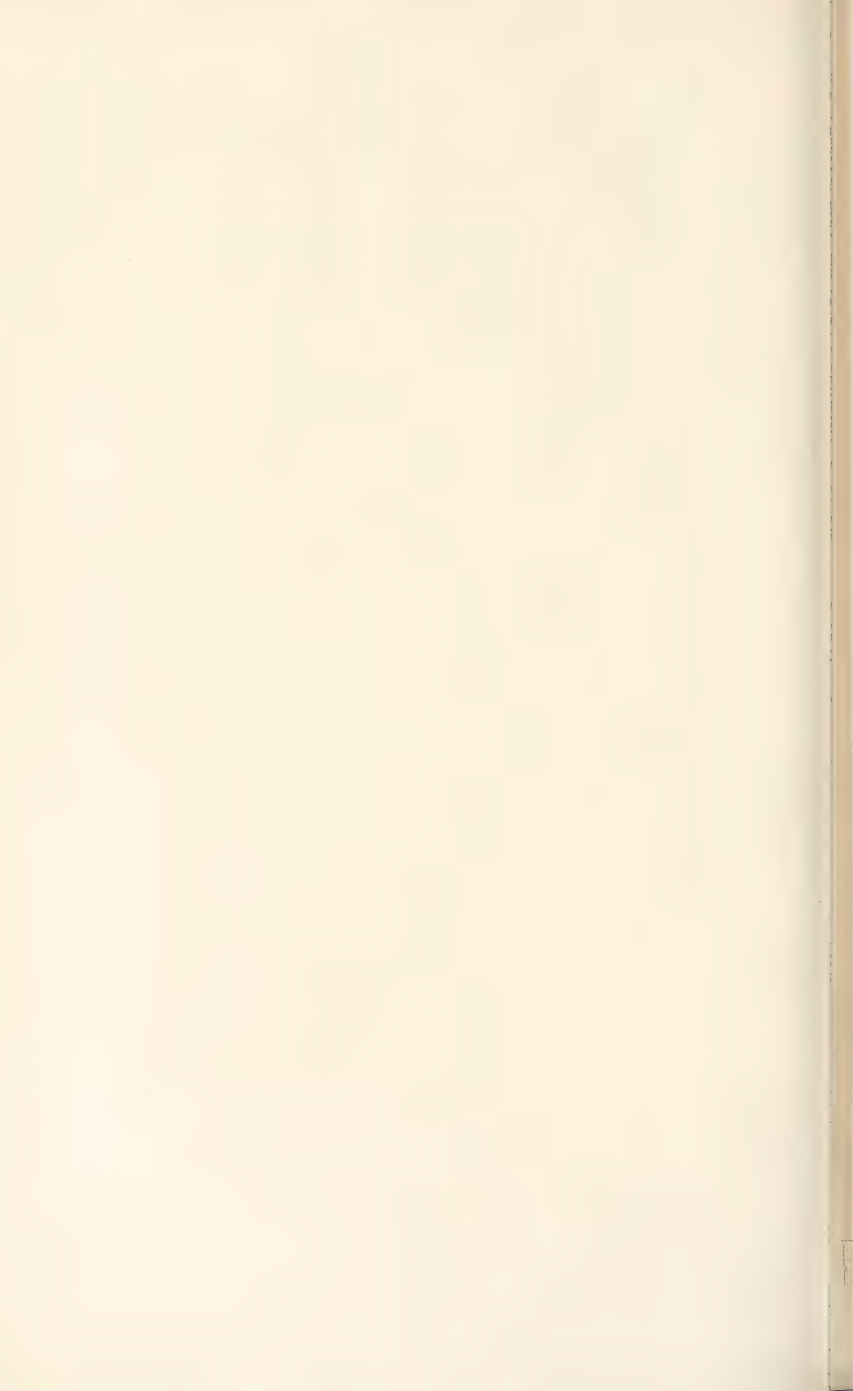




FIG. 3.—Section from the center of an hepatic lobule from a rabbit in which three days before three-quarters of the liver had been removed; among the resting-cells are several nuclei undergoing karyokinesis: *a*, cell in stage of loose skein; *b*, cell with daughter-stars; *c*, two cells apparently formed by recent division. Hardening in Flemming's solution, staining with saffronin. Zeiss homogeneous immersion, apochromatic stain; compensating ocular 6.

FIG. 4.—Margin of two lobules of the liver of a rabbit from which five days before three-quarters of the organ had been removed; there is already visible an abundant mingling of old and new cells; the former are smaller and stained more darkly; the latter more spheric and paler; a large bile-duct with lateral branches occupies the center. These branches show marked proliferation of the epithelium; *a*, bile-duct; *b*, artery; *c*, round-cell infiltration of the interlobular connective tissue. Hardened in Flemming's solution, stained with saffronin (Hartnack 7) (Virchow's Archiv, Bd. cxxxviii., 1895).

intervals of from two to fifty days. As early as the second day karyokinetic changes could be demonstrated in the liver-cells. The height of these changes is attained on the seventh day, and continues until the twentieth or twenty-fifth. The new cells are scattered irregularly through the acini. From the absence of the diaster-form while the other stages of mitosis were abundantly represented, the author concludes that division takes place with exceeding rapidity, and that it is only an accident when a cell is caught in the diaster-stage. The formation of new blood-vessels proceeds also with great activity. As to the question whether the vascular system or the glandular elements are the first to react, the author is of the opinion that it is the latter that respond first. The excitation which leads to the multiplication of the liver-cells is a purely functional one, and, it should be remembered, takes place in an organ or a part of an organ that is entirely normal. The regeneration of biliary ducts was studied especially in dogs by injecting indigocarmine into the circulation and killing the animals in from one and a half to two hours. It was found that there was an extensive formation of biliary capillaries of minute size and regular conformation in the new tissue. [It is interesting to note in passing that jaundice did not develop in the animals deprived of so much of the liver-tissue.]

We append four illustrations showing the microscopic changes that accompany the regenerative processes. (See Plates XXVIII and XXIX.)

Cirrhosis of the Liver.—Hanot and Boix¹ describe a new form of cirrhosis of the liver. The patient is usually from thirty-five to fifty-five years old; the liver at the climax of the affection is enlarged, the surface is smooth, and the margin can be easily felt. There is no pain on palpation. Ascites, change in the spleen, jaundice, excepting slight urobilin-discoloration of the skin, are not seen. The urine may contain urobilin and traces of albumin, but otherwise it is normal. There is no history of alcoholism, and tuberculosis, syphilis, malaria, and other infectious diseases can be excluded. A definite history of digestive disturbance of long standing is found in all cases. For a certain period a progressive enlargement of the liver becomes evident, but after a time it remains stationary except at certain intervals, when an attack of indigestion will induce an acute enlargement, which disappears after the attack. Histologically, there is a general sclerosis of the portal spaces, the central vein remaining intact. The interlobular tissue extends into the lobules themselves, but no hyperplasia of the biliary ducts is observed. The origin of the affection is the long-continued disturbance of digestion, which develops toxins in the gastrointestinal canal. These substances on their way through the liver set up an irritation. The prognosis is good as to life, but the affection renders the patient more prone to infectious disease. As to recovery, much depends upon the liver-cells.

Clarke² reports 3 cases—one in an infant seven months old. There was universal jaundice, with diarrhoea. The legs were edematous; the urine, which at first was suppressed, later contained albumin and bile-pigment;

¹ Am. Jour. Med. Sci., July, 1894.

² Brit. Med. Jour., June 30, 1894.

the liver was the seat of a marked cirrhosis; there was inflammation of the vessels, associated with abundant connective-tissue formation and atrophy of the liver-cells. The process was not syphilitic, but an acute diffuse cirrhosis associated with a rapid destruction of liver-cells, due in part to a widespread endarteritis. The second case was in a child of twelve. Jaundice, edema of the legs, and ascites were present; the urine was slightly albuminous and contained bile-pigments; the liver microscopically showed newly-formed connective tissue, which attacked the lobules from within outward. The change was most marked along the course of the portal vessels. The destruction of liver-cells was less extensive than in the first case, and the connective tissue was more fibrous. There was an absence of endarteritis and of proliferation of the epithelium of the bile-ducts. Since tuberculosis, alcohol, and syphilis could be eliminated from the history, the author concludes that the causes of cirrhosis of the liver in children are in part yet unknown.

The third case was that of an adult, and postmortem showed the usual signs of atrophic cirrhosis. The clinic course of the case was unusual.

Drs. Ormerod¹ and Goodhart² report similar cases.

Sieveking³ made microscopic examinations in 20 cases of atrophic cirrhosis of the liver, due in most instances to alcohol. The distribution of the connective tissue was very irregular, following no definite plan. Only in those cases in which the liver-cells were surrounded by connective tissue did they show any degeneration or atrophy. The author believes that the proliferation of the connective tissue is the primary change. The spleen showed thickened capsule, trabeculæ, and vessel-sheaths, but there was no connective-tissue formation. The change in this organ was the result of congestion.

Carcinoma of the Liver.—Dalleman⁴ reports 3 cases of primary carcinoma of the liver, one of the nodular form, the others of the diffuse form (*forme nodulaire et massif* of Hanot and Gilbert). He believes that the epithelium of the bile-ducts may be the seat of the primary focus of carcinoma of the liver, but he has been unable to demonstrate any actual transition between liver- and cancer-cells. He found, on the contrary, that the secondary nodules destroyed the liver-cells. Extension takes place, he believes, by autometastasis through the blood-channels, for he found cancer-cells in the vessels near carcinomatous foci. He is not able to point to the origin of the primary focus.

Sarcoma of the Liver.—Israel⁵ reports a primary telangiectatic sarcoma of the liver in a girl of fifteen. The tumor was removed by operation, but the girl died of general metastasis fifteen weeks after the operation. The liver was greatly enlarged; secondary deposits were found in the vertebræ and cauda equina.

¹ Trans. of Path. Society, vol. ix. p. 137.

² Atlas of Pathology, New Syd. Soc., fasc. iv. pp. 18, 19.

³ Centralbl. f. Allg. Path., Dec. 31, 1894.

⁴ Jour. de Méd., de Chir. et de Pharm., lii., No. 25, 1894, p. 385; ref. Schmidt's Jahrb., No. 11, 1894, p. 119.

⁵ Deutsch. med. Woch., Aug. 23, 1894.

Aneurysm of the Hepatic Artery.—Schmidt¹ reports a case of fatal hemorrhage from an aneurysm of the hepatic artery that had ruptured into the gall-bladder. The artery was not sclerotic. Between the gall-bladder and the duodenum three ulcerating communications had been produced by the pressure of gall-stones. Through these openings the blood had escaped into the bowel.

Biliary Calculi.—Mayer² made experiments with a view of determining the pathology of biliary calculi. A small unpolished ivory ball was inserted into the gall-bladder of a dog, and the animal killed a year later. There were no adhesions, and the mucous membrane and the contents of the bladder were normal. The ivory ball was covered with a friable pigmented layer which was not crystalline. It contained a little carbonate of lime, but no cholesterin, and was $\frac{3}{4}$ mm. in thickness. Into the gall-bladder of a second dog he introduced two hollow terracotta balls $1\frac{1}{2}$ cm. in diameter. A year later the dog was killed. The gall-bladder contained thickened bile and a concretion the size of a millet-grain. The mucous membrane was healthy, and there were no adhesions. The third experiment consisted in the introduction of two small bits of agar-agar. A year later there were adhesions binding the bladder to the surrounding parts, but the bile and mucous membrane were normal. Mayer believes the nondevelopment of stones in these cases was due to the mucous membrane remaining normal. Naunyn claims that an unhealthy state of the mucous membrane is essential to the development of gall-stones.

Mayer finally introduced into the gall-bladder of a dog a terracotta ball impregnated with a pure culture of bacterium coli. The dog died three days later, the wound having suppurated. No concretions were found. [Other experiments are required to decide what part microorganisms play in gall-stone formation.]

DISEASES OF THE RESPIRATORY TRACT.

Pulmonary Tuberculosis.—Strauss³ does not believe that the majority of cases of tuberculosis of the lungs are due to mixed infection, and that the hectic fever is caused by a septic process dependent on the streptococcus. In 13 cases with marked hectic fever a bacteriologic examination of the blood was negative. (One c.c. of blood was taken from the median cephalic vein and inoculated into agar and bouillon.) Other organisms are not essential factors, and the febrile reaction following the injection of tuberculin is cited as evidence that the products of the tubercle-bacillus are capable of causing fever. He was unable to find either the streptococcus or the pneumococcus in the pneumonic processes in the lungs. That the tubercle-bacillus is capable of causing these changes is proved by the effect of introducing bacilli into the trachea of guinea-pigs: a bronchopneumonia develops which goes

¹ Deutsch. Arch. f. klin. Med.: Centralbl. f. Allgem. Path. und Pathol. Anat., Jan. 30, 1895.

² Virchow's Archiv, 1894, vol. cxxxvi. part 3.

³ La Semaine méd., May 30, 1894.

on to cavity-formation. Microscopic examination reveals no microorganism save the tubercle-bacillus. [The results of Sittmann, whose studies are noted on a subsequent page, differ from those of Strauss. The former found staphylococci in the blood in 3 out of 4 cases of tuberculosis. Positive results were also obtained, in 7 cases out of 9, by Jakowski.¹]

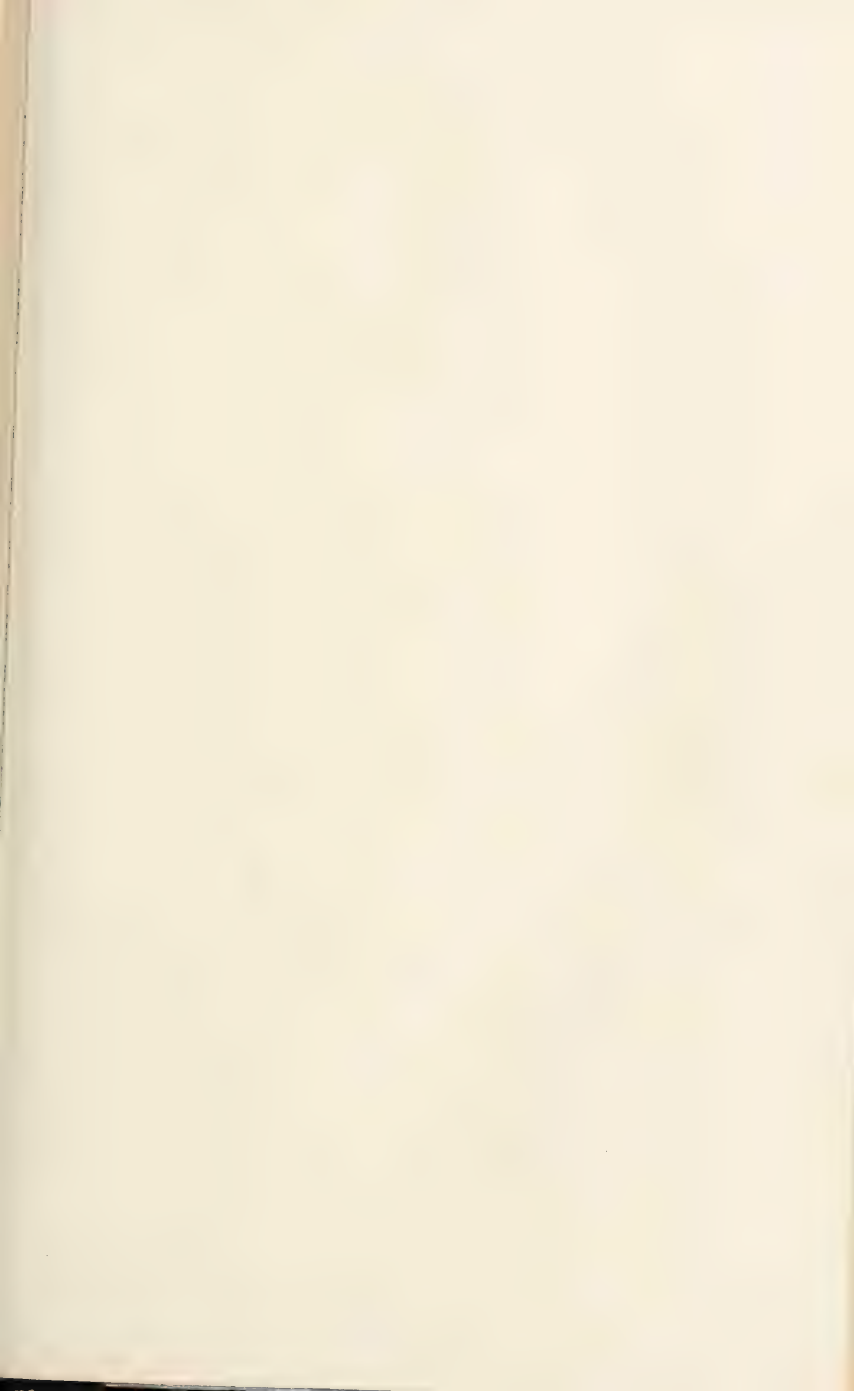
Prudden,² in a paper entitled "Concurrent Infections and the Formation of Cavities in Acute Pulmonary Tuberculosis," after carefully reviewing the relevant literature and giving in detail what is known about the histologic changes produced by the tubercle-bacillus, describes a series of experiments bearing upon the subject. The studies concern the relationships of the tubercle-bacillus and streptococcus pyogenes. Preliminary experiments were made for the purpose of determining the effect upon each other of the tubercle-bacillus and the streptococcus pyogenes. When the tubercle-bacillus and the streptococcus pyogenes are planted together on glycerinated beef-broth, the streptococcus grows as abundantly as in separate cultures, while the tubercle-bacillus does not grow at all. The main series of experiments was made with a view of determining what modifications, if any, are produced in the lungs of rabbits already the seat of tuberculous inflammation by the introduction directly into the lungs through the trachea of the streptococcus pyogenes. The study was taken up in three phases: 1. The effect upon the lungs of the rabbit of the injections through the trachea of pure cultures of the streptococcus pyogenes. 2. The effect upon the lungs of the rabbit of the injection through the trachea of pure cultures of the tubercle-bacillus. 3. The effect upon the lungs of the rabbit of the injection through the trachea, first, of the tubercle-bacillus, and then, after the development of the tuberculous lesion, of the streptococcus pyogenes.

1. As to the effect of streptococcus-injection into the lungs of the rabbit through the trachea, the most common is a bronchopneumonia with hyperplasia of the lymph-nodes. The bacteria soon disappear from the lungs, and the pneumonia in most cases is slight in extent and evanescent; in a few cases the inflammation is prolonged by involvement of the walls of the air-spaces.

2. As to the effect of tubercle-bacillus injections into the lungs of the rabbit through the trachea, the experimenter has it within his power to vary at will, within wide limits, the distribution, extent, and, in considerable measure, the character of the lesions that may follow the introduction into the lungs of the rabbit of pure cultures of the tubercle-bacillus. If a small quantity of the culture be used, and be distributed in very minute flocculi through a considerable quantity of salt-solution, and be injected into the lungs through the trachea, the animal being held upon its back with its head and shoulders high and turned from side to side, small areas of consolidation result having the gross appearance of miliary tubercles. If, on the other hand, larger quantities of the tubercle-bacillus are used, large areas of con-

¹ Centralbl. f. Bakteriol. u. Parasitenk., Bd. xiv., 1893, p. 762.

² N. Y. Med. Jour., July 7, 1894.



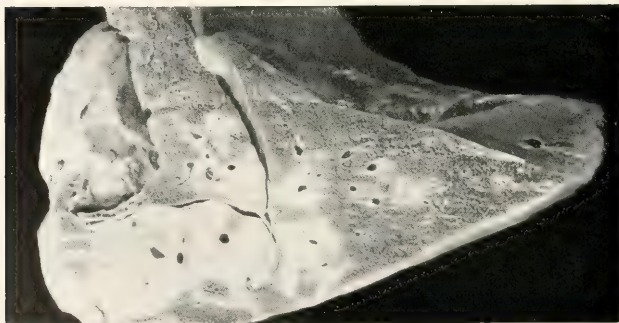


FIG. 1.—Rabbit's lung twelve days after the injection of a broth culture of the tubercle-bacillus through the trachea.



FIG. 2.—Rabbit's lung forty-one days after the injection of a broth culture of the tubercle-bacillus through the trachea.
(New York Medical Journal, July 7, 1894.)



FIG. 3.—Rabbit's lung eleven days after the injection of a broth culture of the tubercle-bacillus through the trachea.

PATHOLOGY.

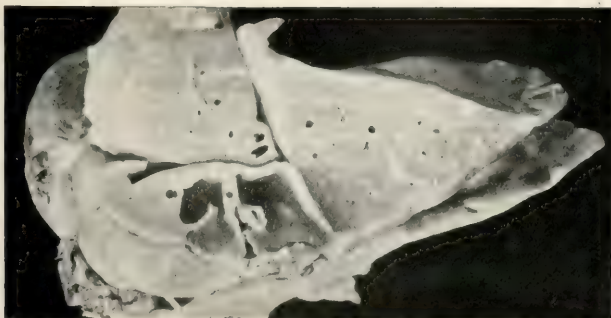


FIG. 4.—Rabbit's lung thirty-six days after the injection of a broth culture of the tubercle-bacillus through the trachea. Formation of cavities.



FIG. 5.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-two days by injection of *Streptococcus pyogenes*. Death after twenty-four hours. Early stage in the formation of cavities.

(New York Medical Journal, July 7, 1904.)

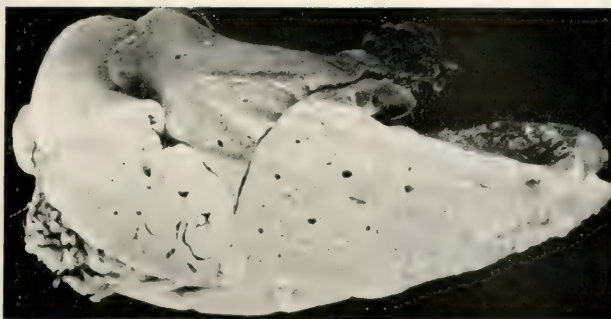
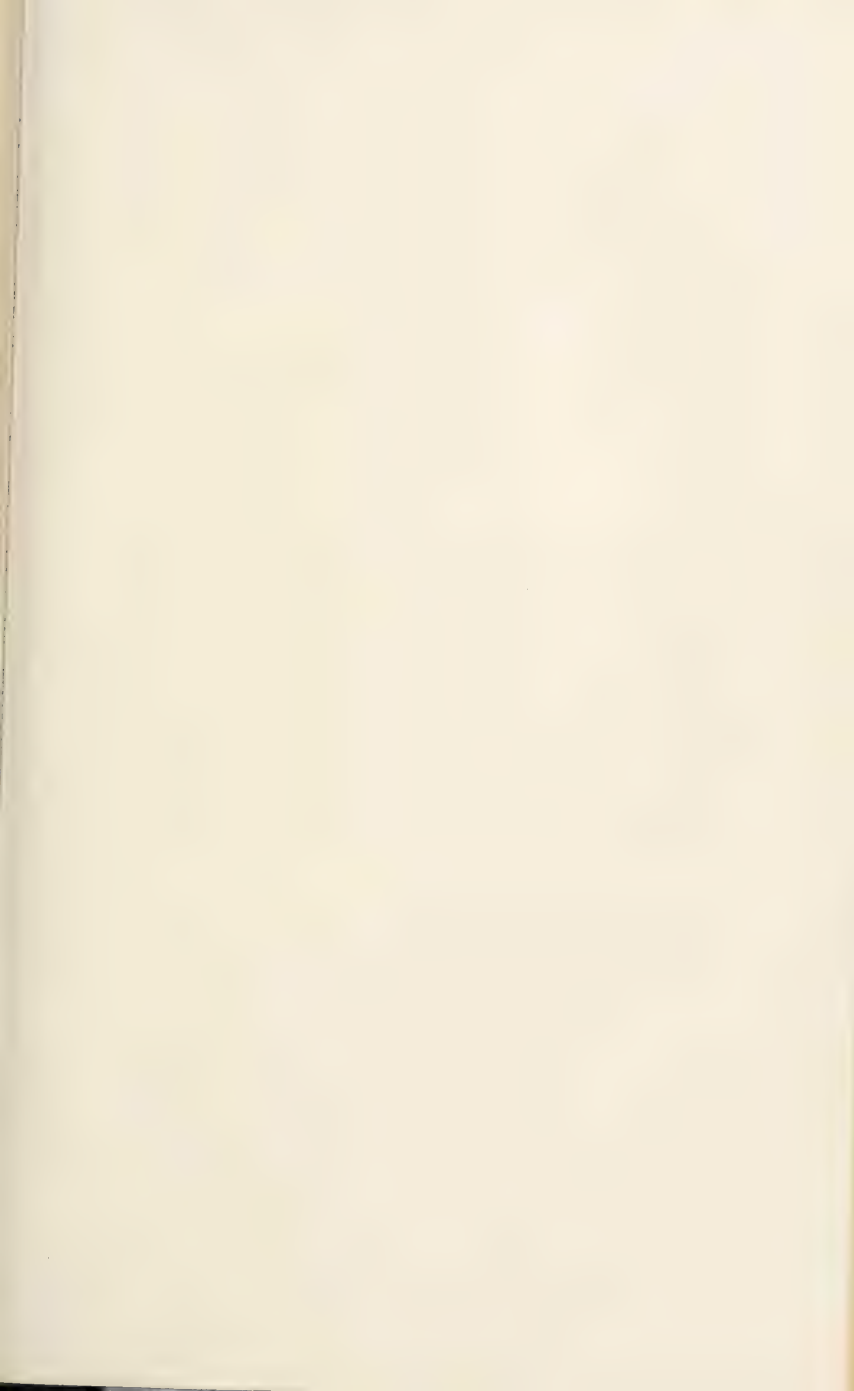


FIG. 6.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Killed after thirteen days. Formation of bronchiectatic cavities.





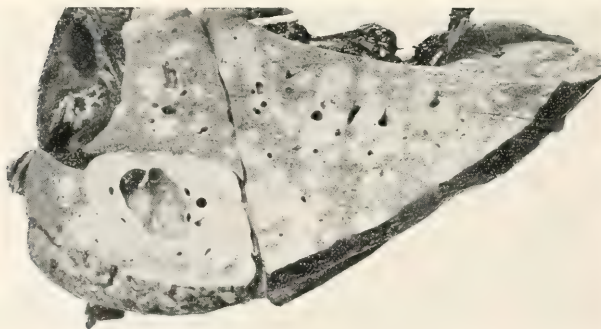


FIG. 7.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Killed after thirteen days. Small cavity and areas of consolidation.

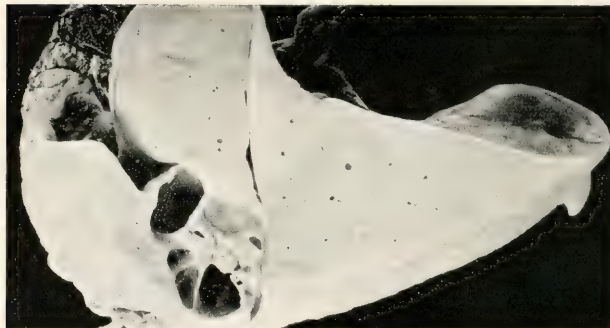


FIG. 8.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-three days by injection of *Streptococcus pyogenes*. Killed after seven days. Small communicating cavities.

(New York Medical Journal, July 7, 1891.)

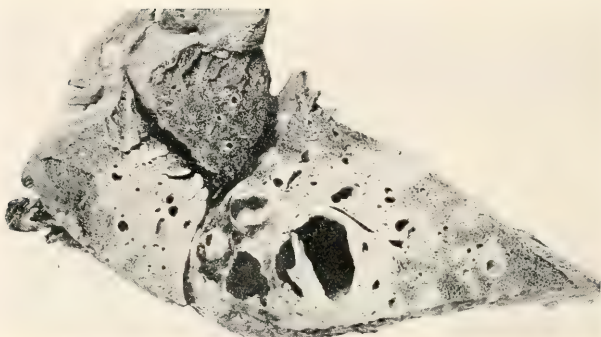


FIG. 9.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Killed after seven days. Large and small cavities and areas of consolidation.

PATHOLOGY.

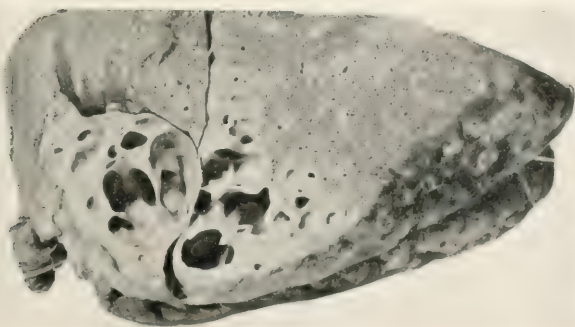


FIG. 10. Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Killed after thirteen days. Numerous communicating cavities.

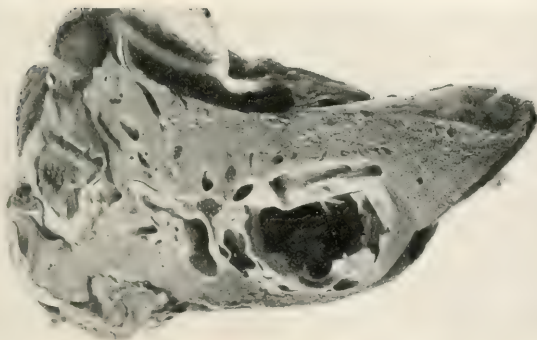


FIG. 11.—Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Death after five days. Large cavity.

(New York Medical Journal, July 7, 1891.)

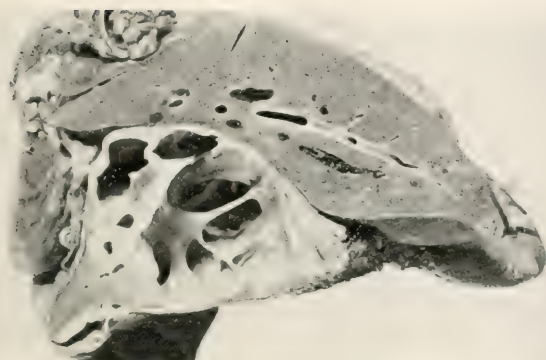


FIG. 12. Rabbit's lung injected with broth culture of tubercle-bacillus, followed after twenty-eight days by injection of *Streptococcus pyogenes*. Death after five days. Large cavities, with suppuration in their walls.

solidation may be induced, involving whole lobes or whole lungs. Under these circumstances the right upper lobe and the posterior part of both lower lobes of the lung are most likely to be consolidated, and to present a gross appearance similar to that of many phases of solid lungs in acute pulmonary tuberculosis or cheesy pneumonia. The formation of cavities in the animal is of exceptional occurrence. The experiments have also shown that the tubercle-bacillus is capable of inducing in the lungs of the rabbit not only the most characteristic phases of tuberculous lesions—cell-proliferation, tissue-formation, and cheesy degeneration—but also an exudative inflammation of varying intensity, closely dependent upon the number of bacilli introduced into the lungs. Furthermore, the effect of the tubercle-bacillus may extend at a considerable distance in the lungs from the seat of the bacillus itself, apparently by the diffusion of some soluble material elaborated or set free by the germ.

3. As to the effects of the introduction of the streptococcus pyogenes into the lungs of rabbits already the seat of experimental tuberculous broncho-pneumonia, the interesting result was the production of cavities in a large proportion of lungs: 9 lungs out of 13 were consolidated, and 8 out of these consolidated lungs showed cavities in various stages of development. The illustrations show these cavities very well. The cavities are due to the softening and absorption of the necrotic small-cell meshes or the cheesy centers of the areas of tuberculous consolidation artificially produced. They run in size from that of a pinhead to those involving a whole lobe. In some cases there is one cavity—in others, a series of communicating chambers crossed by cords and bands of old lung-structures. They all communicate with the bronchi and can be filled through the trachea. They may be surrounded with little or much consolidated lung-tissue, and, in fact, closely resemble the cavities prone to form in human beings in acute pulmonary tuberculosis. The softening may begin as early as twenty-four hours after the introduction of the streptococcus. Calcification of small areas in the walls of these cavities is of frequent occurrence. Streptococci were found in the detritus inside the cavities and in the inner portion of their walls as late as the fifth day after injection, but beyond this time the morphologic examination failed to reveal them. No evidence of an increase of the streptococci after their introduction was found. To what particular substance in the beef-tea culture of the streptococcus the softening effect may be due has not been determined. Whether it is due to the presence of the germs themselves, or the metabolic products elaborated in the lungs, or the products of metabolism manufactured while the germs were under artificial cultivation and introduced with them in the beef-tea culture, is a matter for future investigation. The author is at present disposed to think that this rapid formation of cavities in the tuberculous lungs of rabbits may be due to a simple chemie action of the fluids introduced into the lungs on the ill-nourished and necrotic foci.

In drawing inferences from these studies applicable to man it must be

remembered that the rabbit is more susceptible than man to the tubercle-bacillus, and less susceptible to the action of the streptococcus pyogenes. Furthermore, the conditions of the experiments, particularly the sudden deluging of the tuberculous lungs with living streptococci and their accumulated metabolic products, would suggest reserve in inference. It certainly does not follow, because the secondary injection of streptococci into the tuberculous lungs of rabbits does not incite exudative pneumonia, that the accession of these germs under the usual conditions to human tuberculous lungs does not produce that result. Nor does it follow from the animal-experiments that the streptococcus is a necessary factor in the development of cavities in acute cases in man. The inference seems justifiable, however, that, though not so rapid in their action, the presence of the streptococci, so often found, or of small quantities of metabolic products gradually formed, may contribute to the necrosis and disintegration through which cavities in man are formed or increase in size.

It may be said, in conclusion, that, apart from the details still to be studied, the practical importance of the establishment of the view that tuberculosis of the lungs is liable to assume the character of a mixed infection by the entrance into the lungs and action on the already vulnerable pulmonary tissues of other germs can hardly be overestimated. This conception of pulmonary tuberculosis serves to explain the varying vicissitudes of this disease, and the unfavorable course which it is liable to pursue when its victims are exposed to the widespread chances of infection with pyogenic germs in cities, and especially in crowded and improperly cleaned hospitals. On the other hand, some at least of the beneficial effects of life in the open air are explained, and the rationale of some of the favorable effects of so-called antiseptic treatment becomes clear from this point of view.

Induration-pneumonia.—Regarding the pathogenesis of this condition as a sequel to lobar pneumonia, Aldinger,¹ from the study of a case, concludes that the process begins in the walls of the bronchioles, and leads first to the organization of the fibrinous exudate in the lumen. Proliferation also takes place in the peribronchial tissues, and thence extends to the alveoli contiguous to the bronchiole. In the bronchiole itself the process descends, and after entering the alveoli spreads to neighboring air-cells, the fibrous plugs in which become united by slender bands that penetrate the walls at the position of the pore-canals.

Seropurulent Pleurisy and Tuberculosis.—Lemoine² found that of cultures made with fluid withdrawn from 38 cases of seropurulent pleurisy, 28 remained sterile, while 4 showed pure colonies of staphylococcus albus; 15 of the 28 were cases of pleurisy that was the focus of a tuberculous infection; 1 was a case of pleurisy developing in a case of pulmonary tuberculosis; 7 had suspicious signs at the apex; and 4 were apparent cures. [The opinion of Netter and Vaillard, that when cultures from seropurulent

¹ Münch. med. Woch., June 2, 1894.

² Sem. méd., March 27, 1895.

pleurisy remain sterile it should suggest the presence of tuberculosis, is thus confirmed.]

Empyema Due to the Pneumococcus.—Washbourn¹ reports 2 cases in which the constitutional symptoms resembled those of pneumonia. In Case 2, which was fatal, there were herpes, high temperature, delirium, cough, and rapid breathing, and the patient had all the appearance of one suffering from pneumonia. Yet at the postmortem examination the lung was found to be unaffected. The constitutional symptoms were doubtless caused in the same way as in pneumonia—*i. e.* by the absorption of toxins produced by the pneumococcus.

Influenza.—Pielicke² examined the sputum of 35 cases of influenza, and found the bacillus of Pfeiffer in 15 instances, 5 of which were complicated with influenza-pneumonia. In 1 case the pseudoinfluenza-bacillus of Pfeiffer was found, but continued transplantation for three weeks so modified this organism that it resembled the true influenza-bacillus; hence the author concludes that the two are identical.

Voges³ failed to produce influenza in the lower animals with Pfeiffer's bacillus.

DISEASES OF THE URINARY ORGANS.

Malformations.—Green⁴ reports the case of a female child in which the right kidney and right Fallopian tube and ovary were absent, without any rudimentary structures in their place. [We have found absence of the right kidney, right ureter, and right adrenal in an old woman who had died of chronic nephritis. The left kidney, although cirrhotic, was very much enlarged.]

Rupture of the Bladder.—Coats⁵ reports 2 cases of uncomplicated rupture of the bladder. In neither case was a history of injury obtainable. The first patient was a maniac; the second had been intoxicated previous to his admission to the hospital with the symptoms of acute peritonitis. The diagnosis was not made. The first patient died in five days, the second in two days, after the onset of the illness. At the autopsy the rent was in both instances in the posterior wall of the bladder, a short distance from the fundus; the peritoneum was not inflamed; there was no inflammatory reaction, macroscopically or microscopically, in the vesical wound. It seems, from the statistics of Ferraton and Rivington, that rupture of the bladder is more common in intoxicated persons than in others—a fact that is probably explained by the tendency to overdistention of the bladder which alcoholic liquors bring about. The liquor imbibed increases the amount of urine, and the state of blunted consciousness makes the call to empty the bladder less appreciated. The intoxicated person is also liable to falls, and is not so able to protect himself in falling as the sober person.

¹ Med.-Chir. Trans., lxxvii. p. 179, 1894.

² Berlin. klin. Woch., June 4, 1894.

³ Ibid., Sept. 17, 1894.

⁴ Brit. Med. Jour., Feb. 23, 1895.

⁵ Ibid., July 21, 1894.

Pyelonephritis.—A valuable review of the recent literature on the bacteriology of pyelonephritis is given by Sternberg.¹ His conclusions are that cystitis and ascending pyelonephritis are usually caused by microorganisms introduced through the urethra into the bladder, which is rendered susceptible to infection by mechanic violence or chemic irritation. The most frequent organism causing the infection is the bacillus coli communis, which is constantly present in the intestine and upon the external surface of the anus, whence it may be transported to the interior of the bladder by catheters, etc. According to Bouchard, the bacillus is sometimes found under the prepuce and about the vulva of healthy persons. The organism is, however, not found in the normal urethra.

Uremia.—Hughes and Carter² publish a series of important clinic and experimental studies on uremia. They were able to produce an artificial uremia in dogs by ligation of the renal arteries. The serum or blood of such dogs, when injected into other dogs, induced a similar state in them; the same effect was produced by serum or ascitic fluid of uremic human beings. As to the cause of uremia, the authors believe that it is due to a peculiar poison, the existence of which in the blood is not dependent on the retention of urine or its constituents. One of the facts cited in proof of this is that uremia can occur when there is no demonstrable evidence of disease in the kidneys and normal amounts of urine are being secreted. The injection of the serum invariably produced a degeneration of the renal epithelium. The poison of uremia is probably the same as that which produces nephritis. The authors' conclusions are as follows: 1. Uremia is an intoxication by a poison circulating in the blood. 2. This poison is present in serous effusions as well as in the blood. 3. It is probable that in addition to the pathogenic poison of uremia there are, under certain conditions, other secondary ones active in its production. 4. The poison producing uremia will also produce nephritis and a fatty degeneration of the retina. 5. This poison is probably some albuminous substance. It is affected by heat, and is only with difficulty dialyzable. 6. It is probable, but not certain, that this poison is not constantly circulating in the blood, but that under exceptional conditions it becomes developed. 7. It is possible to have uremia without any previously-existing lesion of the kidneys.

Ulcerative Colitis and Granular Kidney.—Bannatyne³ describes 2 cases illustrating the relationship between ulcerative colitis and granular kidney. The first patient had been suffering from diarrhea for three weeks, with watery and bloody stools passed without much tenesmus. The urine was copious, of low specific gravity, and contained a trace of albumin, but no casts. The autopsy showed peritonitis, especially in the region of the cecum and colon, and the presence of intestinal contents in the peritoneal cavity. There were two perforations in the ascending colon—one in the transverse and one in the sigmoid flexure. The mucous membrane was intensely injected,

¹ Am. Jour. Med. Sci., June, 1894.

² Ibid., Aug. and Sept., 1894.

³ Edin. Med. Jour., Aug., 1894.

and in the colon was studded with large and small ulcers, irregular in shape and extending in some places almost through the mucous coat. The kidneys were in an early stage of interstitial nephritis. A section of one of the ulcers showed a small-cell infiltration of the surrounding tissues and an engorgement of the vessels, but no fibrosis in the walls of the latter. The second case was one of chronic nephritis, in the course of which dysenteric symptoms developed, death taking place from uremia. The kidneys showed the macroscopic and microscopic features of interstitial disease. In the bowel were found numerous submucous hemorrhages and a few superficial ulcers, which were not surrounded by inflammation. Most of the ulcers arose in connection with a hemorrhage, the floor of many consisting of a blood-clot. The walls of the small blood-vessels presented well-marked sclerosis. In Case 1, in which the renal symptoms had not been marked and the structural change was not advanced, while the intestinal lesions were intense, it is evident, according to the author, that the colitis was primary. In the second case the renal symptoms dominated the picture, the microscopic changes showed sclerosis of the vessels and but little inflammation about the ulcers, which seemed to have arisen in an area of hemorrhage.

[Attention was first called to the association of ulceration of the bowel and renal disease by Dickinson in the Croonian Lectures of 1876. The same author in a more recent paper¹ has collected 22 cases. The ulcers seem to originate in foci of hemorrhage. In 11 cases the ulceration was confined to the small intestine; in 5 to the large; in 5 both were affected; in 1 the ulcers were "near the cecum." In size the ulcers varied from 2 inches by 1 to spots no larger than the heads of raindrops. The ulcers were usually regular in shape, more or less circular, without thickening, and with "punched" edges. It would seem to us as if the ulcers might be "peptic" in origin, the ecchymotic spots constituting *loci minoris resistentiæ*.]

Sulphonal Nephritis.—Stern² describes a case of toxic nephritis which developed after the prolonged use of sulphonal. During life hematoporphyrin and albumin had been found in the urine.

Renal Sarcoma.—Brandt³ reports a case of a male infant of fifteen months in which a sarcoma of the right kidney filled two-thirds of the abdominal cavity.

A Ptomain in the Urine in Influenza.—Griffiths and Ladell⁴ have isolated from the urine in influenza a ptomain having the formula $C_9H_9NO_4$. It is toxic, producing fever, and death in animals in eight hours. It is obtained by alkalinizing a considerable quantity of urine with sodium bicarbonate, and adding half its volume of sulphuric ether. After filtration the solution is treated with tartaric acid, which forms with the ptomain a soluble tartrate. The solution is again treated with ether and evaporated, when the

¹ Medico-Chir. Trans., lxxvii. p. 111.

² Deutsch. med. Woch., March 8, 1894.

³ Norsk Magazine for Lægevidenskaben; Canadian Practitioner, Sept., 1894.

⁴ Compt. rend. des Séances de l'Acad. des Sciences, cxvii., No. 22, p. 744; Med. News, Aug. 11, 1894.

ptomain will remain. The body is a whitish, crystalline substance soluble in water of slightly alkaline reaction. It forms a chlorhydrate, a chlorplatinat, and chloraurate. With phosphorwolframic acid it gives a brownish, with phosphormolybdic acid and with picric acid a yellowish, with tannic acid a reddish, and with mercuric chlorid a whitish, precipitate.

Studies in Urinalysis.—Garrod¹ states that the color of uric-acid crystals is due to the yellow pigment urochrome and the reddish pigment uroerythrin, and not to urobilin or hematoporphyrin. In some cases the color of the crystals may be modified by the action of mineral acids, of the oxidation-products of phenol-derivatives, and the pigment of the bile.

Indican and Suppuration.—Beckmann,² in studying the value of the increase in the excretion of indican as a diagnostic agent in suppuration, examined carefully 25 patients suffering from the most varied forms of suppuration, and 15 cases in which there was no suppuration. He concludes that the only source of the formation of indican in pathologic processes is the intestines, and that there is no etiologic relation between suppuration and increased excretion of indican.

Traumatic Glycosuria.—Higgins and Ogden³ have made a study of 211 cases of head-injuries in order to determine the frequency of traumatic glycosuria and its possible relation to the nature of the lesion. The cases are divided into five classes:

1. The simple scalp-wounds and other minor head-injuries.
2. Scalp-wounds with bone exposed.
3. Cases of concussion, meaning those followed by loss of consciousness without fracture.
4. Fractures of the vault of the skull.
5. Fractures of the base of the skull.

There were in the 212 cases 20 that presented glycosuria, or 9.43 per cent., divided as follows:

Class 1. Number of cases 84; glycosuria 5, or 5.95 per cent.

Class 2. Number of cases 43; glycosuria 4, or 9.3 per cent.

Class 3. Number of cases 40; glycosuria 1, or 2.5 per cent.

Class 4. Number of cases 24; glycosuria 5, or 20.8 per cent.

Class 5. Number of cases 21; glycosuria 5, or 23.8 per cent.

Albumin and casts and blood were found in every case containing sugar, probably secondary to the renal irritation produced by the sugar. Acetone and diacetic acid were not found in any of the cases, and the authors advance the proposition that the presence of these substances is a point in favor of a permanent glycosuria following traumatism.

The following are the general conclusions: 1. After injury sugar may appear in the urine as early as six hours and disappear within twenty-four, the average time for its appearance, however, being from eight to twelve

¹ Jour. of Pathol. and Bacteriol., Nov., 1894.

² St. Petersburg. med. Woch., July 16, 1894.

³ Boston Med. and Surg. Jour., Feb. 28, 1895.

hours; for the disappearance of the same, from the fifth to the ninth day. 2. A small proportion of the cases may exhibit a permanent glycosuria from the date of injury to the head. 3. Acetone and diacetic acid are rarely if ever found in such cases, excepting where the condition becomes a permanent glycosuria, and even then probably only after a number of months or years. 4. Of the 20 sugar cases here recorded, 11 (55 per cent.) had received an injury to the right side of the head; 5 (25 per cent.) to the left side; 3 (15 per cent.) to the occiput; and in 2 (10 per cent.) there were no external evidences of violence. 5. It is impossible in the present state of the knowledge of the pathology of diabetes and glycosuria to draw any inferences from the autopsies that have been obtained. 6. There is little to be said in regard to the mortality. Of the 20 cases, 8 died—6 deaths being the direct result of severe injuries, 1 from intercurrent disease, and the third probably from alcoholism. In the 212 cases, 16 were fatal, 50 per cent. of these having glycosuria.

A Pentose in the Urine.—Salkowsky¹ records the existence in several specimens of nonfermentable urine that reduced Trommer's solution of a carbohydrate having 5 atoms of carbon—a pentose. The substance forms lemon-yellow needles with phenylhydrazin. The method of obtaining these is as follows: To from 200–500 c.c. of urine add 2.5 g. of phenylhydrazin per 100 c.c. The phenylhydrazin is previously dissolved in acetic acid until the reaction is distinctly acid. The mixture of urine and acid phenylhydrazin is heated in a beaker almost to boiling; the beaker is then placed for one to one and a quarter hours in a water-bath heated to boiling. On cooling the yellow crystals are formed. As a test for pentose Salkowsky recommends Tollen's reaction. A small quantity of phloroglucin is dissolved in 5 or 6 c.c. of fuming hydrochloric acid, a little of the substance being present in excess. The solution is divided into two equal parts, and to the one 0.5 c.c. of the suspected urine is added, to the other 0.5 c.c. of normal urine having approximately the same density. The test-tubes are placed in a beaker containing boiling water: in a few moments the pentose-urine shows an intense-red ring, spreading toward the bottom, while the normal urine is not at all or only slightly altered. The tubes are at once removed, as a too-long immersion diminishes the accuracy of the test.

The urines containing pentose present no special features. They reduce Trommer's solution; Fehling's solution is changed to a green, then to a yellow color; it becomes opaque, but a precipitate is not formed. Nylander's (bismuth) test is not obtained perfectly; the precipitate is not black, but gray. The fermentation- and the polarization-tests are negative. The significance of pentose has not been determined: its presence in the urine depends on some anomaly of metabolism. Urine containing pentose cannot be said to contain sugar. It is probable that pentose is a decomposition-product of a nucleoproteid found by Hammersten in the pancreas.

A Method of Staining Tube-casts.—Bramwell² recommends the following method for the staining and mounting of tube-casts and other organic

¹ Berlin. klin. Woch., April 29, 1895.

² Brit. Med. Jour., July 9, 1894.

urinary deposits. A conical glass is filled with equal parts of urine and aqueous solution of boric acid, and set aside until the deposit settles. The deposit is then drawn off with a pipet and transferred to a test-tube containing about half a dram of picrocarmin-solution, and the two mixed by inverting the tube two or three times, the end being closed with the thumb. The test-tube is then set aside for twenty-four hours. The deposit that settles is drawn off by a very fine-mouthed pipet, placed on a slide, covered, and examined. Any casts present can be readily detected by this method. If amyloid disease is suspected, a solution of methyl-violet may be used instead of the picrocarmin. The casts can be permanently mounted in Farrant's solution in the following way: The stained deposit is drawn off from the test-tube by means of a fine-mouthed pipet and transferred to a small test-tube three-quarters full of Farrant's solution. The small tube is then securely corked, inverted two or three times in order that the colored urine and the Farrant solution may be thoroughly mixed, and set aside until the sediment has had time to settle. After three or four days a drop of the sediment is placed on a slide, covered, and examined. The preparation may be sealed after a few days. If the specimen is over-stained, the deposit that has collected in the small tube should be drawn off and transferred to fresh Farrant's solution.

Any organic sediment may be stained and preserved in the same manner.

For Preserving Microscopic Specimens.—Von Frisch¹ suggests the following method for preserving microscopic specimens of urinary deposits: A glycerol-jelly of 1 part gelatin, 4 parts glycerol, and 2 parts distilled water is made. A drop of the urinary deposit is placed upon a cover-glass and partially dried; it is then superimposed on a glass slide upon which a drop of the glycerol jelly has been placed. When the sediment is organized, it is advisable to color the gelatin with fuchsin. The method can be employed with either crystalline or organized sediments.

DISEASES OF THE NERVOUS SYSTEM.

Congenital Anomalies.—Heard² reviews the literature of the subject of congenital anomalies of the spinal cord and oblongata, and finds altogether but 6 cases recorded. To these he is able to add 2 which were carefully studied in Prof. Obersteiner's laboratory in Vienna. In the first of these 2 cases two anomalous bundles were discovered in a medulla otherwise perfectly normal. The one bundle, termed *a*, took its origin at the lower level of the decussation of the pyramids from the lateral column and ascended upward, lying internally to the substantia gelatinosa. A second bundle, *b*, lay near the floor of the fourth ventricle, almost in the median line. It appeared to be connected with the nuclei funiculi teretes and the nucleus centralis superior, and possibly served as an abnormal communication between the cells of these structures.

In the second case, a medulla showing pathologic changes, a bundle, *c*,

¹ Zeit. Oest. Apoth. Ver., 1894.

² Am. Jour. Med. Sci., Aug., 1894.

ascended in the lateral column from the level of the decussation of the pyramids, lying to the mesial side of the substantia gelatinosa. It extended up into the pons. Its greatest width was 0.75 mm. Several small anomalous bundles ran midway between the hypoglossal and pneumogastric nuclei. The author concludes that the nervous system possesses, like other organs, a tendency toward occasional misplacement of its elements. The misplacement has so far never been observed to occur bilaterally. The most frequent and constant anomaly appears to be the presence of a column of white nerve-fibers (columns *a* and *c*) arising at the level of decussation of the pyramids, and thence proceeding upward along the inner side of the substantia gelatinosa.

Vacuolation.—Campbell¹ discusses vacuolation of the nerve-cells of the cerebral cortex. The first step in vacuolation is a slight uniform swelling and a change of the normal staining reactions of the protoplasm; later one or more highly refractive oil-droplets form; they multiply, enlarge, and coalesce, and finally destroy the nucleus or the cell-protoplasm, or both. In the insane dying of pulmonary tuberculosis, pneumonia, and other diseases, there were fatty degeneration of the muscle-fibers of the small cortical blood-vessels and also vacuolation of the cortical nerve-cells. The formation of vacuoles is due to toxemia. It was found in 44 out of 47 cases of pulmonary tuberculosis.

Hydrocephalus.—O'Carroll² reports 2 cases of hydrocephalus, associated with complete absence of communication between the fourth ventricle and the subarachnoid space. The ventricle in the first case was closed behind by a dense, fibroid membrane between 3 and 4 mm. thick; in the second by a close, dense adhesion. This condition was probably due to an original adhesive leptomeningitis.

Forced Insomnia.—Manaccine³ has carried out an interesting series of experiments in 10 young dogs on the effects of complete insomnia. Four dogs died in from ninety-two to one hundred and forty-three hours after total deprivation of sleep. After the second twenty-four hours the temperature began to sink, falling 4° or 5° C. up to the time of death. The reflexes and the pupillary reaction grew steadily weaker. The number of red blood-corpuscles sank rapidly from 5,000,000 to 2,000,000, but rose again in the last twenty-four hours. Anatomically, the most marked lesions were shown by the cerebrum. Many ganglion-cells were in a state of fatty degeneration, and the perivascular spaces were filled with leukocytes. Small capillary hemorrhages were found in the cortex, and more extensive extravasations in the optic nerve and optic thalamus. The body-weight was reduced from 5 to 13 per cent. In no instance could an animal be saved by warming, artificial respiration, and abundant sleep after an insomnia of ninety-six to one hundred and twenty hours.

¹ Jour. Pathol. and Bacteriol.; ref. in Yorkshire Med. Quar., vol. iii. p. 65, 1894.

² Dublin Jour. Med. Sci., Oct. 1, 1894.

³ Arch. ital. de Biol., xxi., No. 2, p. 332, 1894; ref. in Schmidt's Jahrb., No. 1, p. 9, 1895.

Hydrophobia.—Roocroft¹ reports a case of hydrophobia with autopsy; unfortunately, no microscopic examination was made. The patient was a man thirty-nine years of age. No history of dog-bite was obtainable, but there was a recent scar on the left forearm which had been caused by a rusty piece of pipe about three weeks previously to his visit to Mr. Roocroft. Later it was learned that the man had been scratched on the finger by a strange dog, but no scar was found. Typic symptoms of hydrophobia developed, and the man died five days after the onset of the disease. Rigor mortis was well marked. There was a slight scar on the left forearm, but no trace of any inflammatory action about it. No mark of any scar was seen where the dog-bite had been. The thorax, heart, and pericardium were healthy. The lungs were red and congested and filled with frothy mucus; here and there small hemorrhages had occurred. The tongue, pharynx, esophagus, and trachea were removed together. The tongue was enlarged, swollen, and injected, and near the base there was distinct and well-marked hypertrophy of the papillae. At the root there were several varicose veins. The pharynx was intensely injected, especially about the region of the epiglottis, where there was a dark ring passing all round the pharynx and enveloping the epiglottis in front. The esophagus was injected, and exhibited many varicose veins with small hemorrhages, especially on its posterior wall. The trachea was injected, and showed small hemorrhages. The stomach was injected, and exhibited dilated veins and many submucous hemorrhages. The spleen was dark in color, enlarged, and hemorrhagic. The kidneys were congested, and showed evidence of parenchymatous nephritis. The brain and vessels were intensely injected. There were extensive small-cell infiltration into the subarachnoid space, many small hemorrhages, and several patches of commencing softening in the gray matter. The medulla and cord were much injected, and there was infiltration of the perivascular sheaths with leukocytes. The membranes of the cord exhibited small hemorrhages and varicose veins.

Cysticercus in the Brain.—Forster² reports a case of cysticercus cellulose in the brain of an insane woman aged thirty-seven. There were 4 cysts, each about as large as a hazelnut.

Cerebellar Lesions.—Campbell³ reports a series of 5 cases of cerebellar lesions in which the nervous system was carefully studied for degeneration by the method of Marchi. In the first case, in which the greater part of the inferior surface of the left cerebellar lobe was destroyed in consequence of thrombosis of the posterior inferior cerebellar artery, some degeneration was seen in the left middle cerebellar peduncle; more, however, in the left inferior peduncle, and, curiously, marked degeneration in the left direct cerebellar tract and in the funiculus cuneatus, there being much more disease in the former than in the latter. In the third case, the gross lesion in which was hemorrhage in the dentate bodies of both hemispheres and in the white

¹ Lancet, Dec. 8, 1894.

² The Canadian Practitioner, Dec., 1894.

³ Brit. Med. Jour., Sept. 22, 1894.

matter surrounding the nuclei (the right side being more affected), there was a similar acute parenchymatous descending change in the direct cerebellar tract, particularly of the right side. Cases 1 and 2 presented degeneration along the restiform bodies to the cuneate nuclei, thence along the funiculi cuneati, and thence down the posteroexternal columns of the spinal cord as far as the commencement of the dorsal region. The author was also able to demonstrate in these cases a connection between these posteroexternal fibers and the ganglial cells situated in the lateral projections of the anterior cornua in the cervical region. He is inclined to regard the outer part of the posteroexternal column as a direct descending cerebellar tract connecting the cerebellum with the lateral anterior cornual cells of the lower cervical region on the same side. This part of the posteroexternal column is, as is well known, rarely sclerosed even in advanced cases of *tabes dorsalis*.

Particularly interesting are the changes in the direct cerebellar tract, which tract the researches of Flechsig, Mott, Tooth, and others have shown to be a centripetal one. The author does not think that in consequence of the destruction of their terminus these fibers underwent a secondary atrophy, but concludes that the changes were degenerative, and that descending degeneration may occur in this tract in consequence of a cerebellar lesion, as well as an ascending one in consequence of a spinal lesion.

Degeneration was also found in some of the cranial nerves (III, V, VI, VII, XII), which is in accord with Marchi's observations, but not with those of Russell, quoted below. [There is, indeed, a marked discrepancy between the results of experimental lesions and those produced by disease.]

Russell¹ has studied the course of degenerations consequent on experimental lesions of the cerebellum. After ablation of one lateral lobe he found that all the cerebellar peduncles on the side of the lesion contained degenerated fibers, and that, in addition to this, degenerated fibers were present in the superior peduncle of the opposite side, while neither of the other peduncles of this side contained any degenerated fibers. The degenerated fibers in the superior peduncle on the side of the lesion were traced to the opposite red nucleus and optic thalamus, where they terminated after decussating in the region of the posterior quadrigeminal bodies. Those in the opposite superior peduncle were fibers which degenerated from the seat of the lesion to the intact lobe of the cerebellum, and left it by this peduncle. The fibers which degenerated in the middle peduncle on the side of the lesion could be traced chiefly to the gray matter of the opposite side of the pons. There was no evidence that the degenerated fibers accompanied the pyramidal bundles for any distance, either upward or downward. No degenerated fibers passed from this peduncle to the corpora quadrigemina of the anterolateral region of the spinal cord by way of the fillet or posterior longitudinal bundle, as has been asserted by Marchi. The inferior peduncle contained degenerated fibers, which occupied chiefly the periphery of the lateral region of the me-

¹ Brit. Med. Jour., Sept. 22, 1894.

dulla oblongata. As they descended they became scattered, and ceased to form a tract below the level of the superior pyramidal decussation. A few scattered degenerated fibers might be found in the anterolateral region of the cervical cord, beyond which none could be traced. Degenerated fibers could be traced into both inferior olives from this peduncle, but no well-marked tract to the opposite inferior olive, as described by Ferrier and Turner, was found. Marchi's statements, that degenerated fibers passed from this peduncle to the ascending root of the fifth, the roots of the cranial nerves through the posterior longitudinal bundles, and the spinal nerves by the descending anterolateral tract, could not be corroborated.

Extirpation of the middle lobe of the cerebellum was followed by degeneration in all the peduncles of the organ. This was in harmony with the results of Marchi, but not with those of Ferrier and Turner. The degenerated fibers in the superior peduncles occupied all parts of them, as seen in transverse section, being found both in the parts of this peduncle which they occupied on the side of the lesion after removal of one lateral lobe, and that which they occupied on the opposite side after this unilateral lesion. The degenerated fibers decussated in the region of the posterior quadrigeminal bodies, and terminated in the opposite red nucleus, beyond which no degenerated fibers could be traced.

The degenerated fibers of the middle peduncles passed to the gray matter of the pons, much in the same way as they did after ablation of one lateral hemisphere. Those in the inferior peduncles became more and more scattered as they passed down, and could not be said to form a lateral tract below the level of the lower end of the inferior olives. There was no evidence to support Marchi's statements that degenerated fibers passed from these peduncles to the cranial nerve-roots through the posterior longitudinal bundle, or to the anterolateral columns of the cord through the fillet. The writer holds, in agreement with Ferrier and Turner, (1) that no anterolateral tract, such as described by Marchi, degenerated in the spinal cord after lesions limited to the cerebellum; (2) that accidental injury to adjacent parts is responsible for degeneration of this anterolateral tract—a conclusion rendered probable by the fact that Ferrier and Turner found a similar tract degenerated after injury to Deiters' nucleus, and that Mott also found such a degenerated tract after injury to the posterior column nuclei.

Amiotrophic Lateral Sclerosis.—Mott¹ reports the pathologic findings in a case occurring in a woman of thirty-nine. There were degeneration and sclerosis of the whole motor tract from the cortex of the central convolutions down to the pyramids. The crossed and direct pyramidal tracts in the cord were involved along their entire extent. There was a disappearance of the large motor pyramidal cells of the cortex. There was also atrophy and degeneration of the anterior horns, especially in the lumbosacral and cervical regions of the cord. Beginning degeneration was observed in the hypoglossal, lower facial, and spinal accessory nuclei. The anterior root-zone,

¹ Brit. Med. Jour., Sept. 22, 1894.

the lateral limiting layer of ground-fibers, and the anterior roots were all involved. The phrenic and vagus nerves were degenerated. In the ulnar and median nerves there were atrophy and degeneration of the fibers. The membranes were thickened; the small arteries and capillaries were also thickened, and minute hemorrhages were found in the cortex. It would seem that the process commenced synchronously in the whole motor tract, and was not a process creeping up the cord.

Senator¹ reports the case of a woman of fifty-seven, clinically presenting the symptoms of anyotrophic lateral sclerosis—viz. paralysis of the upper and lower extremities, contractures, stiffness, increased reflexes, ankle-clonus, atrophy of the hand-muscles, paresis and atrophy of the tongue and lips, dysphagia, difficult speech, etc. Mental functions, sensibility, and sphincters were unaffected. After the disease had lasted five years the patient succumbed to a bronchopneumonia. The cord showed the following changes: Marked atrophy of the ganglion-cells in the anterior horns of the cervical and dorsal segments, hemorrhages in the cervical enlargement. Clarke's column was not affected. The vessels of the entire cord were over-distended with blood, but their walls were normal. There were also hemorrhages into the white matter; the gray matter was softened in places. The nerve-roots showed no changes. The absence of degeneration in the lateral pyramidal tracts was surprising, in view of the clinical symptoms. There may have been changes in the brain to account for the spastic phenomena, but it would then also be strange not to have any descending degeneration. Senator concludes, with Leyden and against Charcot, that the disease is not an affection *sui generis*, and proposes to term such conditions atrophospastic paralyses of spinal or bulbar or bulbospinal origin.

Pseudohypertrophic Paralysis.—Von Babes² describes a peculiar appearance in the nerve-terminations in this disease, consisting in a defective development of the motor-ending and of the fiber that gives rise to it, and a degeneration (dissolution) of the already formed end-plate, the two appearances being apparently distinct. The termination of the nerves in the muscles consisted of a small, pale, conical enlargement. In two teased specimens the author noted a single thick medullated fiber divide into two branches, sweeping round in semicircular fashion to reunite in a distinct ring—a condition never observed before. From each segment of this ring sprang a fine medullated branch, which, after winding around the parent branch for some distance, left it to end freely; one of these branches shortly after ending in contact with a muscle-fiber. The other fiber passed into the connective tissue, ending freely in an oval termination comparable to the termination of a sensory nerve; at least it was not motor. The double termination of a single medullated nerve-fiber in a motor and a sensory ending in the muscular tissue the author is inclined to view as possibly normal. [This is an interesting discovery if it is verified by others.]

¹ Deutsch. med. Woch., May 17, 1894.

² La Roumaine médicale, Aug., 1894; Brit. Med. Jour., Epitome, 274, Oct. 6, 1894.

Friedreich's Disease.—Clarke¹ gives an extended report of a case from which we abstract only the part referring to the pathologic changes in the nervous system. The lesions in the spinal cord were most marked in the posterior columns, next in the lateral; there was also involvement of the margin of the cord, with thickening of the pia and of the walls of the vessels, and probably with hyperplasia of the neuroglia, and small size of the cord. The changes were diffuse and nowhere had produced complete degeneration; they were slighter in degree than those in the cases heretofore reported. There was also a cerebellar tumor (small round-cell sarcoma) springing from the inferior surface of the right lobe. From the clinical history it appears that the tumor was of rapid growth, and the symptoms it produced were superadded to those of the original spinal disease.

Paralysis Agitans.—Redlich² in a study of 7 cases of paralysis agitans found the following changes in the spinal cord: Small patches of sclerosis in the posterior and somewhat less marked in the lateral columns; in the anterior columns the changes were either slight or absent. The median and ventral parts of the posterior column, those near the median commissure, were most affected. All the changes were most marked in the cervical and lumbar swellings. In the cervical region there was always a more or less extensive sclerosis in Goll's columns. The sclerosis originated from the vessels, and was of the nature of perivascular sclerosis. Large sclerotic patches were produced by the coalescence of several small patches. The vascular changes consisted in endarteritis or periarteritis, with extension of the inflammatory process to the surrounding tissues. In the gray matter there were no changes beyond thickening of the vessels. The cells of the anterior horns and Clarke's columns were in nearly all cases pigmented. Changes similar to those described by the author have been found in ten cases recently published by various writers. Paralysis agitans may therefore be regarded as a disease with a distinct pathologic anatomy. In addition to the changes described, others of less importance are found which must be looked upon as senile.

Poliomyelitis.—Redlich³ records a case in which he found an acute inflammatory process involving the entire length of the cord, affecting chiefly the anterior horns, particularly in the lumbar region. There were also small foci of inflammation in the posterior horns, in the central substantia gelatinosa, in part of the column of Clarke, and in the anterior and lateral white tracts. Only one such focus was found in the posterior column. The vessels in the white matter, as well as those outside the cord, were inflamed. A similar process was presented by the medulla oblongata and the basal ganglia. The peripheral nerves were degenerated, especially the phrenic and inferior laryngeal. The muscles had undergone fatty degeneration. There may be some doubt as to the proper diagnosis of this case. The lesions suggest the

¹ Brit. Med. Jour., Dec. 8, 1894.

² Jahrb. f. Psych., Bd. xii. p. 385, and Centralbl. f. Allgem. Pathol., und Pathol. Anat., Nov. 4, 1894.

³ Lancet, Dec. 29, 1894.

action of a toxin on the vessels, and, secondarily or simultaneously, on the nervous structure.

Diver's Palsy.—Sharples¹ has had the rare opportunity of studying a case of this disease at autopsy and microscopically. The cord was normal externally, but on being sliced prior to placing it in Müller's fluid was found to contain areas of extreme creamy softness. Microscopically the lesions were seen to be limited to the cervical and upper dorsal cord, and consisted of softening and degeneration of the columns of Burdach of both sides and, to a less extent, of the columns of Goll. A few diffuse and irregular spots were found in the lateral columns, and a series in the right anterior horn of the cord which could be traced all down the cord. Some of the blood-vessels were excessively dilated, and a few showed (incipient) hemorrhages. The writer attributes the lesions to the excess of pressure and the changes of pressure to which divers are subject. The primary results are hemorrhages, which are followed by secondary softening. This accounts for the scattered character of the lesions, although it does not explain why the cervical and upper dorsal cord are chiefly affected.

Acromegaly.—A careful pathologic study of a case in a woman is published by Arnold.² The following postmortem pathologic changes were found: In the hypertrophied parts thickening of the epidermis and cutis; a large amount of pigment in the rete Malpighi; hypertrophy of the sudorific glands; numerous warts and mollusca fibrosa; thickening of the walls of the blood-vessels; thickening of many of the bones; arthritis deformans of the articulations; the length of the bones unchanged; the muscles partly hypertrophic, partly atrophic; the peripheral nerves and the lower part of the cord thickened (increase of the interstitial connective tissue with hyaline degeneration of the nervous elements); degeneration of the pyramidal tracts; two areas of cerebral softening; the hypophysis increased in size, containing an adenoid tumor; the right lobe of the thyroid and the thymus hypertrophied. In this case there was hypertrophy of the soft parts and the bones, with degeneration of the muscles, nerves, and blood-vessels. The changes found in the hypophysis were insufficient to explain the affection, and the author considers the condition to be of trophoneurotic origin.

DISEASES OF THE THYROID GLAND AND SUPRARENAL CAPSULES.

Cachexia Strumipriva.—Maragliano³ discusses the blood-changes in this disease. Under the author's direction Sciolla examined the blood of dogs before and after thyroidectomy, and found a slight oligocythemia and a certain degree of leukocytosis, diminished specific gravity of the blood, an increased amount of water, and a smaller dry residue. There was no marked change in the serum. The dogs, however, lost their appetite and developed severe convulsions, to which conditions the blood-changes might be second-

¹ Jour. Nerv. and Ment. Dis., Oct., 1894.

² Virchow's Archiv, vol. cxxxv.; abstr. in Jour. of Nerv. and Ment. Dis., Oct., 1894.

³ Gaz. degli Ospedali, Oct. 20, 1894.

ary. It is unnecessary to assume that the thyroid gland possesses any hematopoietic function to account for these changes, as has been done by some writers. The diminished power of fixing oxygen which was found in the blood by Albertoni and Tizzoni might be due to the alteration in the pulmonary epithelium which follows thyroidectomy. The blood, like the other tissues, is bound to suffer from the intoxication due to the absence of the thyroid gland. Extirpation, according to Sciolla, always leads to the death of the dogs after tetaniform convulsions; removal of the spleen does not prevent it. Some relation seems to exist between the thyroid gland and the sexual organs, for the extirpation of the latter modified the cachexia considerably; this was more marked even after excision of the spleen. The dogs died comatose in fifteen or twenty hours.

Exophthalmic Goiter.—Reinhold's¹ case followed an attack of grippe. It was complicated with an acute inflammation of the right and middle lobe of the thyroid. The symptoms developed in three months. The author holds that the disease resulted from an acute infectious inflammation of the thyroid gland.

Myxedema.—Gron² reports the results of an autopsy on a woman of sixty-two who had died of myxedema. There was atrophy of the isthmus of the thyroid gland; also of the lobes. Microscopically, the organ was infiltrated with round cells, the original structure being almost entirely gone. The pituitary body was the size of a walnut and completely filled the sella turcica.

Sarcoma of the Thyroid Gland.—Sieveking³ reports a case of this neoplasm in a man. The gland was uniformly enlarged, and there was involvement of the cervical, axillary, and thoracic lymphatic glands. The gland was not adherent to surrounding tissues. On section it presented a gray appearance. Microscopically, it consisted of round cells with large nuclei, and was traversed by bands of connective tissue. Secondary deposits were found in the cervical, axillary, and thoracic lymphatic glands, in the epicardium, liver, omentum, peritoneum, mesenteric glands, medulla of the long bones, and the kidney. Round-cell sarcoma is an exceptional occurrence in the thyroid gland, the author succeeding in collecting only 3 cases from the literature: 2 of these were spindle-cell sarcoma, the other myxosarcoma. It is worthy of note that there was no evidence of myxedema or tetany in the patient. Very probably enough of the tissue of the thyroid remained to prevent these complications.

The Suprarenal Capsules.—Auld,⁴ after reviewing the late researches on the origin of the adrenals, which point to a derivation of the organ in the higher vertebrates from the mesonephros, describes certain colloid changes that he observed in the medulla of suprarenal capsules apparently normal. The presence of colloid material was associated with a dilatation of the vessels; in some instances the masses were found within the acini, an appear-

¹ Münch. med. Woch., June 5, 1894.

² Brit. Med. Jour., No. 1757, 1894.

³ Centralbl. f. Innere Med., Dec. 29, 1894.

⁴ Brit. Med. Jour., Oct. 6, 1894.

ance resembling that seen in parts of the pituitary body being produced. No colloid substance was ever present in the cortex. The author believes that the existence of the colloid material indicates an abnormal functioning on the part of the gland.

In regard to the functions, the author places the organ in relation with the renal-vascular and nervous systems, the functions being the destruction of certain effete products of metabolism which are of the nature of ptomains, and the elaboration of a secretion which is absolutely essential to the blood. Its destruction is followed by an autointoxication and a profound alteration in the chemistry of the blood, which entail, amongst other things, degenerative or nutritional changes in the nervous and digestive systems, and derangement of the color-regulating metabolism.

Berdach,¹ having observed an abnormally low temperature in a case of primary sarcoma of the suprarenal capsule, determined to study experimentally the influence of extirpation of the two adrenals upon temperature as well as some other phenomena. The capsules were removed from 12 dogs. In the operation, which was conducted under narcosis with strictest antiseptics, a single incision 3 cm. in length was made below the right costal border and almost parallel with it, and both organs removed through the one incision. Three animals died of hemorrhage during or shortly after the operation; 7 died in the course of a week; 2 remained alive. One of the latter was killed in four weeks; the other was living and presented no pathologic conditions four months after the operation.

Previous experimenters, such as Brown-Séquard, Gratiolet, Tizzoni, Abelous and Langlois, and de Dominicis, had all seen animals die within a short time after the removal of the adrenals, but the author's results confirmed those of Harley, Phillipeau, Riesel, Stilling, and particularly those of Nothnagel, who crushed both organs with a forceps in 153 rabbits, and found that although the suprarenal tissue had been converted into an inflammatory and caseous mass, the animals could live for weeks, months, and even years, without presenting any signs of debility and anemia.

Berdach bestowed special attention in his experiments on the body-weight, the condition of the intestinal tract, and the temperature. The last fell in 2 cases 3° C.; in 3 cases, 3.5° C.; in 1 each, 3.9° C., 4° C., and 4.3° C.; in 1, 7° C. (from 40° to 33° C.). The lowest temperature observed was 26.2° C.

The author believes that the hypothermia may prove of value as a diagnostic sign, and refers to a case of Draschke's in which tuberculosis of the adrenals was diagnosed in a case of pulmonary tuberculosis on the strength of this symptom.

The loss of weight varied from 200 to 1800 g., but was regained in the 2 dogs that remained alive; in 1, indeed, the original was exceeded by 200 g.

Regarding the bowel-function after extirpation of the suprarenal capsules

¹ Wien. med. Woch., Dec. 15, 1894.

opinions differ: some have observed constipation, others diarrhea. It has been supposed (Jacoby) that the adrenals functionate toward the intestines as an inhibitory center through the medium of the splanchnics, and that diarrhea follows when by extirpation the inhibition is removed. In the author's experiments, however, constipation was present in every instance but one.

Pigmentation of the skin was not observed. The experimental results lead the author to the belief that disease of the suprarenal capsules is not the basis of Addison's disease, but that the true cause is connected with the sympathetic nervous system.

The cases—and a number are cited—in which changes could not be demonstrated in the splanchnics and semilunar ganglia can be explained by assuming that the inflammation in the capsules, which are intimately connected with the sympathetic and cerebrospinal nervous system, may induce in the nerves a state of functional irritation. This would furnish a key also to the transitory remissions in Addison's disease.

We append the author's conclusions: 1. The adrenals are not absolutely necessary to life, as is demonstrated by the removal of the organs, the surrounding nervous elements being carefully spared. The animals can survive without developing any morbid phenomena. 2. After extirpation, as well as in uncomplicated disease of the capsules and the adjacent nervous structures, the temperature is often subnormal, a symptom to which diagnostic importance can be attached. 3. Neither the subnormal temperature nor the other features of Addison's disease can be ascribed to disease of the supra-renal capsules, but are due to an affection of the sympathetic nervous system.

Boinet¹ records the results of the removal of the suprarenal capsules in rats. In 48 cases in which both capsules were removed death ensued in from two to thirty-eight days. When an interval intervened between the removal of the first and that of the second, death was postponed in 1 case to eighty-three days. In 1 rat the right capsule was removed and grafted into the peritoneal cavity; four days later the left capsule was removed: the rat was still living after fifty-six days. The author disagrees with de Dominicis, who claims that total removal of both glands at one time is always followed by death in from two to four hours. A rat in which the pedicle of one capsule was ligated, while the other was removed and grafted, lived fifty-one days. The animal dies more quickly if the capsule in such an experiment is not grafted, and when both pedicles are ligated death occurs earlier than when total removal has been done.

The postmortem examination after total ablation of both capsules revealed congestion and suggillations of the lungs, hypertrophy of left heart, enlargement of thyroid gland and spleen. There was no leukocytosis; the red blood-cells were diminished.

Boinet appears to second the view held by Arnaud and Alezais, that

¹ Sem. méd., Nov. 3, 1894.

there is systematic ascending degeneration, beginning in the juxtacapsular ganglia and spreading to the great splanchnic nerves and semilunar ganglia, then to the lateral tracts of the cord.

Rolleston¹ reported a case of fibroadenoma of the suprarenal capsules.

Earle and Weaver² report a case of sarcoma of the right suprarenal capsule in an infant. The child was anemic and jaundiced; the liver was enlarged, the gall-bladder distended. At the autopsy the suprarenal capsule was found to surround and compress the portal vein. On section the tissue was yellowish-brown, with a soft, dark central portion. The organ was 3 inches in length. Microscopically, the dense fibrous portion of the adrenal presented the appearance of a mixed-cell sarcoma.

TUMORS.

[The progress of the past year still leaves unsolved the question as to the etiology of malignant tumors. Pathologists are now inclining to the view that the majority of the so-called parasites are products of degeneration. The present status of the question may be summarized as follows: The malignant tumors bear the impress of a parasitic origin; the parasite, whether vegetable or animal, has not been found.]

Carcinoma—Inoculation of Epithelioma.—Moran³ has succeeded in inoculating a cylindric epithelioma of a white mouse through several generations of animals of the same species. The inoculated tumor-mass caused metastases, the latter being favored by traumatism. With each generation the transplantation of the neoplasm became more and more difficult and its malignant character less marked.

Smith,⁴ from a review of the literature and a study of 12 specimens, comes to the conclusion, first, that carcinoma presents a course and clinic aspect analogous to the formations that are of parasitic origin; secondly, that within carcinomatous tissues bodies occur that resemble the different life-stages of protozoa, sporozoa, and gregarinidæ.

Kinschurf and Bartsch⁵ have also repeated the experiments of Adamkiewicz on carcinoma-implantation. They found that if careful antiseptic precautions were employed, the implanted carcinoma-tissue degenerated and was absorbed.

Power⁶ obtained soil from parts of England where the mortality from carcinoma was high, mixed the soil with carcinoma-pulp, and placed rats upon it so that the feet and tail were constantly in contact with the mixture. The rats were also sprayed with the pulp, and the mucous membranes were kept irritated so as to establish a place of lessened resistance. Postmortem examination of 6 rats thus treated failed to demonstrate any lesion. Many

¹ Brit. Med. Jour., Oct. 20, 1894.

² Jour. of Am. Med. Assoc., Dec. 29, 1894.

³ Archiv. de Méd. expér. et d'anat. path., 1894, No. 5; Centralbl. f. Allgem. Path. und Pathol. Anat., Jan. 30, 1895.

⁴ N. Y. Med. Jour., Jan. 5, 1895.

⁵ Beitr. z. klin. Chirurg., Bd. xi. Heft 2.

⁶ Brit. Med. Jour., Sept., 1894, p. 637.

degenerated cells were seen similar to those that have been described as parasites. The experiments are purely negative in character.

Gratia and Lénaux¹ have attempted to inoculate carcinoma into lower animals. Fresh tumors were grafted into the skin, the peritoneum, and the walls of the stomach. Fresh carcinoma-juice was injected into the organs most frequently the seat of the disease. They failed to transmit the disease from man to dog or from dog to dog, and conclude that contagiousness, direct or indirect, has not been proved; that transplantation can be done principally on individuals displaying a peculiar predisposition to the disease; that the parasitic origin is yet a matter of doubt; that the cause and pathogenesis are still undecided.

Van Niessen² obtained under strict precautions some blood from the wound by which a carcinomatous uterus was removed by the vagina. In this blood, which had been received in a test-tube, there developed within a week, along with other microorganisms, a dark-green, round mold about the diameter of a pea and having a raised border of lighter tint. Microscopic examination and cultivation proved the organism to be intermediate between the yeasts and the mold-fungi. It grew well in human blood, in sterile diabetic urine, and in water, but its growth on these media was very different. As the cell-groups of the fungi bear a striking resemblance to the epithelial cell-nests of carcinoma, the author is inclined to look upon the organism as the immediate cause of carcinoma. He proposes, on account of its resemblance to *Cladosporium herbarum*, the name of "*Cladosporium cancerogenes*" or "*canceromyces*."

Technique in the Study of Etiology of Malignant Neoplasms.—Ohlmacher³ pronounces very strongly against relying solely on the newer methods of technique in the study of the etiology of malignant tumors. Working with a myxosporidium discovered by him in the kidney of the common toad, he found that Flemming's solution, Hermann's solution, and Peryni's fluid were harmful to the sporidia; in other words, solutions containing chromic acid or osmic acid, agents that have been especially relied upon heretofore, distorted and altered greatly the appearance of the organisms, although they preserved the cells and nuclei of the renal tissue with the usual excellence. In addition, the reagents customarily employed are very likely to produce crystalline deposits and give rise to artefacts that are readily mistaken for parasites.

McFarland⁴ discusses the etiology of carcinoma, and comes to the conclusion that it is not specific—that the etiology may be said to be dependent upon the inherent proliferative tendency of the epithelium; that is, it is epitheliogenetic, not parasitogenetic.

Snow⁵ discusses the part played by phagocytosis in carcinoma. About the focus of carcinomatous disease there is a dilatation of the vessels and an

¹ North. Am. Pract., Dec., 1894.

² Centr. f. d. med. Wissensch., May 26, 1894.

³ Jour. Am. Med. Assoc., June 30, 1894.

⁴ N. Y. Med. Jour., June, 1894.

⁵ Provincial Med. Jour., p. 618, 1894.

accumulation of leukocytes similar to that which is observed when a foreign body is inserted in the tissues. The emigration of leukocytes dates from the very outset, and antedates the liquefactive processes, and is independent of the secondary inflammation. The invasion of the leukocytes is progressive, and extends beyond the margin of the carcinomatous deposit. There is no evidence of a struggle with any organism. The leukocytes do not appear to enter the carcinoma-cells or otherwise to invade the cell-masses. On the other hand, they do not perish, since true suppuration is rarely seen. Leukocytes have no inhibitory influence on the progress of the disease. They seem to soften and macerate the organized fibrous tissue, and thus facilitate its progress. The giant-cells or myeloid corpuscles seen in carcinoma are purely passive, and are minute coagula. There is here, then, an exception to the theory of the phagocytic action of the white blood-corpuscles. They play no part in arresting the progress of carcinoma, and are not seen to enter the cells, but appear to aid the extension of the process by softening the surrounding tissues.

An admirable microscopic study of a case of carcinoma of the breast, with extensive metastasis, is that of Leith.¹ Secondary growths were found in the lungs and pleuræ, the bronchial glands, the epicardium and endocardium (not the myocardium), the liver, the spleen, the suprarenal bodies, the kidneys, the pancreas, the stomach, the dura mater, and the bone-marrow.

Neugebauer² describes a psammous carcinoma from the female breast. The patient was a woman of fifty years. Macroscopically, the tumor presented the features of the ordinary carcinoma. Microscopically, it proved to be an adenoid carcinoma with cylindric cells, and contained in the center of the epithelial nests round shining masses concentrically laminated, which gave the test for calcium carbonate. The origin of these bodies from the epithelial cells was easily demonstrated. The metastatic growths in the axillary glands presented the same features as the primary tumor.

Sarcoma.—Pawlowsky³ examined 14 cases of sarcoma, and claims to have found parasitic bodies of the type of sporozoa. They showed at times metachromatism; that is to say, they stained differently from the sarcoma-cells. They are not the result of degeneration nor are they intruded leukocytes. They consist of small globules and ovoids, which are spores, and of cyst-like bodies filled with spores, which are the sporocysts. They are found in the cell-protoplasm. When these sporocysts burst, the contents make their way into the surrounding cells and into the intercellular substance. The cell thus invaded begins to hypertrophy, and then to subdivide. The spores degenerate in some cases, and form colloid bodies which are found in the protoplasm of the hypertrophied cells, and are filled with pigment-granules. Injections of fresh bits of tumor into the lymph-sacs of frogs and under the skin of rabbits gave negative results.

¹ Edinburgh Med. Jour., Aug., 1894.

² Langenbeck's Archiv, Bd. xlviii., 1894; Centralbl. f. Allgem. Path. und Pathol. Anat., Jan. 30, 1895.

³ Virchow's Archiv, vol. cxxxiii.

Clarke¹ describes certain intranuclear bodies from a case of alveolar sarcoma of the breast. The bodies were stained reddish-yellow with hematoxylin-eosin, and a brownish-red with Biondi's stain. They attained an average size of 10 μ , and the larger the intranuclear body the smaller was the amount of chromatin remaining in the nucleus. Some of the larger bodies could be traced escaping from the nucleus into the cell-protoplasm or into the intercellular spaces. Having escaped from the cell-nucleus, they became enlarged and chromatin appeared within them. The larger of these extranuclear bodies corresponded with the bodies described by the author in squamous epithelioma and in sarcoma as free and sporing parasites, differing, however, in some respects.

It was also claimed that the parasites of variola and vaccinia were identical in form with many of the phases of the parasites of this sarcoma. He had also found similar forms in the lesions of syphilis.

Kanthack in discussing Clarke's paper expressed the belief, which evidently is justified, that the so-called parasites described by Clarke were degeneration-products.

Meigs and de Schweinitz² report a case of round-cell sarcoma of the anterior mediastinum with extensive metastasis, including the brain, both choroid coats, oculomotor and optic nerves, and external ocular muscles. It is interesting to note that, despite the extensive deposits in the eyes and their appendages, there was little macroscopic change, and the condition would probably have been overlooked had it not been for an unusual size of the oculomotor nerves. The secondary affection of the choroid coat present in this case proves the possibility of metastasis to parts that are generally the seat of primary growth.

Endothelioma.—Driessen³ reports the finding of glycogen in three endotheliomatous tumors. The first was a tumor developed in connection with the upper third of the ulna; the second occurred in a horseshoe kidney; the third was also a renal tumor. Microscopically, the tumors were rich in cells and had somewhat of an alveolar arrangement. The nuclei resembled those of epithelial cells. Near the nucleus was a strongly refractive, homogeneous globule, in some cases several small globules, which gave an intense brown color with the iodine-iodide solution. Driessen considers the tumors to have sprung from the endothelial cells of lymphatic spaces.

Psamomma.—Kanthack and Lockwood⁴ report a psammoma of the tunica vaginalis and one of the vermiform appendix.

Cholesteatoma.—Concerning cholesteatoma of the middle-ear cavities, Haug⁵ sums up the question of the origin as follows: First, there exists, although occurring rarely, a primary cholesteatoma, probably formed by an inclusion of epidermic elements. Secondly, the great majority of cholesteatomas are probably secondary formations produced by an ingrowth of the

¹ Brit. Med. Jour., April 6, 1895.

² Ziegler's Beiträge, Bd. xii. p. 65.

³ Am. Jour. Med. Sci., Aug., 1894.

⁴ Brit. Med. Jour., April 6, 1895.

⁵ Centralbl. f. Allg. Path. u. Path. Anat., Feb. 23, 1895.

flat epithelium of the external ear through a perforation of the membrane into the cavities of the middle ear. We need not necessarily assume that a metaplasia occurs, but the mere ingrowth of the epithelium is not sufficient to produce a cholesteatoma; other factors are essential. In the first place, the invader epithelium no longer functionates as a covering layer, and, instead of extending as a thin stratum on the surface, it proliferates and forms superimposed thick masses. Retrograde changes take place in the epithelium because there is a constant struggle between the production of new epithelium and removal of the old.

Rhabdomyoma.—Stittmann¹ exhibited before the Munich Medical Society a man, aged sixty, who had sustained an injury in the right upper arm forty-two years before. At present a tumor the size of a man's fist occupied the side of the biceps muscle, with which it was connected by a narrow bridge. Electric stimulation proved the tumor to be composed of striated muscle—a rhabdomyoma.

Lipoma.—Klaussner² adds another to the 3 cases collected by Madelung, of lipoma of the neck associated with malformation of the thyroid gland. In the author's case the lipoma, which was encapsulated, was situated beneath the superficial fascia, and on removal no trace of the left lobe of the thyroid gland was discoverable. No opinion is offered on the possible connection between the tumor and the anomaly in the thyroid body.

GENERAL TECHNIQUE.

Fixation of Tissues.—Zenker³ recommends the following fluid for the fixation of tissues:

Distilled water,	100.0 ;
Mercuric chlorid,	5.0 ;
Potassium dichromate,	2.5 ;
Sodium sulphate,	1.0 ;
Glacial acetic acid,	5.0.

The solution resembles Müller's fluid in color, does not deteriorate with age, and can be kept on hand in large quantities, although it is advisable not to add the glacial acetic acid until just before using. On the addition of the acid a fine veil-like precipitate of the mercuric chlorid is produced. The solution has a remarkable penetrating power. Thin pieces are fixed in an hour, pieces of 1 cm. thickness in twenty-four hours, and larger specimens in forty-eight hours. To secure uniformly good results it is best to leave the tissue for twenty-four hours in the solution. The tissues do not shrink in the fluid, and can be cut without difficulty after imbedding in paraffin, which method the author employs. On the whole, the solution is as efficient as Flemming's or Hermann's solution, and is much cheaper.

The further treatment after fixation in the fluid consists in thorough

¹ Münch. med. Woch., Dec. 26, 1893.

² Ibid., April 9, 1895.

³ Ibid., July 3, 1894.

washing in running water, dehydration in alcohol of gradually increasing strength, the removal of the remainder of the mercuric-chlorid precipitate with iodine-alcohol. There is no contraction during the dehydration in alcohol. The author tried all forms of staining on the sections hardened in the fluid, and obtained excellent results, even in the staining of bacteria and of mastzellen and eosinophile cells. Good results were secured with Weigert's nerve-stain after the tissues had been kept in the solution for two weeks, which is a far shorter time than that required by Müller's fluid.

Hardening Medium.—Eccles¹ recommends formic aldehyd as a hardening medium for tissues. For soft tissues a 40 per cent., for firm tissues a 20 per cent., and for very firm tissues a 10 per cent., solution is used. The advantages are that it hardens the tissues quickly (in about three days), does not render them brittle, or deprive them of the power of taking the stain.

Dry Preparation of the Brain.—Campbell² recommends the following as a substitute for Giacomini's method of making a permanent dry preparation of the brain : 1. As soon as possible after removal, the brain is stripped of its membranes and placed in a saturated solution of mercuric chlorid (7½ per cent.). In this solution it is allowed to remain for forty-eight hours, at the end of which time its shape will be fixed. 2. Wash in water, and then harden in methylated spirit for from three to five weeks, changing the spirit two or three times during this period. 3. When quite firm, immerse in oil of turpentine and place for three days in an incubator heated up to 45° C. 4. Change into melted Cambridge soft paraffin, and allow to remain in the incubator just above the melting-point of the paraffin for from four to five days. 5. Extract, cool in water, clean away all the paraffin from the surface and sides of the preparation, and finally apply a thick coat of spirit-varnish. 6. The brain can then be freely handled, and may further be painted with the usual mixture of oils, colors, turpentine, and gold size.

Method of Preparing Tissues.—Coats³ recommends the following rapid method of hardening and preparing tissues for microscopic examination : A thin slice of tissue, not more than 2 to 4 mm. in thickness, is cut with a sharp knife and placed in a test-tube containing some cotton at the bottom and half filled with absolute alcohol. The slice should lie perfectly flat. The tube is placed in a water-bath, and is kept at a temperature of about 40° C. for from thirty to sixty minutes. Water from the hot tap may be employed, the temperature being judged by the hand. The tissue is then dried and placed on the freezing plate of the microtome in a large drop of oil of anise, which congeals at the comparatively high temperature of from 45° F. to 75° F. The alcohol does not interfere with the process ; a few pressures on the bulb of the ether-spray are sufficient to freeze the oil. The knife may be moistened with alcohol, or, if the area of the section is small, may be used dry. The sections are placed in alcohol to remove the oil of anise ; they are next floated out in water and placed on a slide for staining.

¹ Brit. Med. Jour., May 26, 1894.

² Liverpool Med.-Chir. Jour., July, 1894.

³ Jour. Pathol. and Bacteriol., May, 1894.

Mayer's carmalum is preferred by the author, with picric acid as a contrast stain. The first solution is prepared as follows:

Carminic acid,	1 ;
Alum,	10 ;
Water,	200.

Dissolve with heat; add some preservative, as thymol.

The picric-acid solution consists of—

Alcohol,	70 ;
Aqueous solution of picric acid,	30 ;
Hydrochloric acid,	0.5.

Stain for Amyloid.—Galeotti¹ recommends the following modification of the iodine-stain for amyloid substances: Sections of the tissue, hardened in alcohol, are thoroughly washed to remove all the alcohol, and are immersed for from twenty to thirty minutes in a 5 per cent. solution of potassium iodide; are then rapidly washed in water, and afterward transferred to chlorin-water. The chlorin unites with the potassium and liberates the iodine, which stains the amyloid a deep mahogany-brown, while the tissues remain almost colorless. The sections are again washed in water and mounted in glycerin.

A very good staining agent is also *thionin*, recommended by Kantorowitz.² The sections are stained in a saturated watery solution for from three to five minutes, are washed and dehydrated in alcohol, cleared in anilin-oil-xytol, and preserved in balsam. The amyloid areas are lilac, the normal tissues blue. Mucin is stained red by the same method.

Mounting Medium.—Piffard³ recommends what he terms naphthalin-amber as a mounting medium in microscopy superior to those now in use. It is prepared by dissolving purified liquidambar in monobromide of naphthalin, and has a very high refractive index ($N_2=1.625$).

Photomicrography.—Leonard⁴ recommends instantaneous photomicrography as a most efficient method of studying cell-motion. The author claims to have demonstrated by this method that the red blood-corpuscles, as well as the white, are endowed with amoeboid movement.

GENERAL BACTERIOLOGY.

The Bacillus of Bubonic Plague.—Kitasato⁵ gives the following description of the bacillus discovered by him in Hong-Kong in June, 1894: The bacilli are found in the blood, in the buboes, in the spleen and the other internal organs of the victims of the plague. They are rods with rounded ends, stain readily with the ordinary anilin dyes, the poles being stained

¹ Centralbl. f. Allg. Path. u. Path. Anat., No. 7, 1894.

² Ibid., No. 3, 1894.

³ Med. Rec., May 4, 1895.

⁴ Am. Jour. Med. Sci., June, 1895.

⁵ Lancet, London, Aug. 25, 1894.

darker than the middle part, especially in blood-preparations, and present a capsule, sometimes well marked, sometimes indistinct. The bacilli found in the spleen are best stained by a solution of methyl-blue. Whether they stain by Gram's method has not been determined. The bacilli show very little movement; those grown in the incubator in beef-tea render the medium somewhat cloudy. The growth of the bacilli is strongest on blood-serum at the temperature of the human body: under these conditions they develop luxuriantly, and are moist in consistence and of a yellowish-gray color; they do not liquefy the serum. On agar-agar jelly (the best is good glycerol-agar) they also grow freely. The different colonies are of a whitish-gray color and by reflected light have a bluish appearance; under the microscope they appear moist and in rounded patches with uneven edges: at first they appear everywhere as if piled up with "glass-wool," later as if having dense, large centers. If a cover-glass preparation is made from a cultivation on agar-agar, long threads of bacilli are seen that might, by careless inspection, be mistaken for a coccus-chain, but are recognized with certainty as "threads of bacilli" under closer observation. The growth on agar-gelatin is similar to that on agar-agar; in a puncture cultivation at the ordinary temperature after a few days they are found growing as a fine dust in little points along the puncture, but with very little growth on the surface. Whether these bacilli are able to liquefy ordinary gelatin was not determined, as the temperature of Hong-Kong ranges so high that the employment of simple nutritive gelatin is out of the question. On potatoes at a temperature of from 28° to 30° C., there was no growth after ten days' observation, but at a temperature of 37° C. the bacilli developed sparingly after a few days.

Mice, rats, guinea-pigs, and rabbits are susceptible to inoculation. The animals become ill in from one to two days after the inoculation. Their eyes become watery; they refuse their food, move but little, and generally hide quietly in a corner of the cage. The temperature rises to 41.5° C., and death takes place with convulsive symptoms in from two to five days. The parts around the point of inoculation are infiltrated with a reddish gelatinous exudation. The spleen is enlarged. Sometimes there is swelling of the lymphatic glands, and in all the organs the bacilli are found. The results noted after death are very similar to those found in malignant edema. Animals fed with pieces of the internal organs containing the bacilli or with pure cultures die in a few days under the same symptoms as those which have been inoculated. Of the animals inoculated with the dust from houses in which plague-stricken patients had been, some died of tetanus, and one guinea-pig of plague-symptoms, and in its blood and organs the same bacilli were found as in the patients that had succumbed to the plague. The bacilli were also found in many rats and mice that had died spontaneously in the streets of Hong-Kong. Details are then given of the effect of desiccation, heat, and chemic agents on the growth of the bacteria. A short review of the course of the plague is given herewith: History shows us that plague-

epidemics existed in the fourteenth century both in Asia and Europe, and thousands of human beings perished. Since then from time to time, now here, now there, an epidemic has appeared, and until lately the disease almost seemed to have vanished from the face of the earth. This, however, was not so. In China it has existed to this day, especially in Yun Nan, where it occurs every year in an endemic form. From the latter place it was imported to Canton, and from Canton for the first known time it has reached Hong-Kong. The recent outbreak has given us an opportunity for studying this malady—a cause of mystery for centuries—with the means which modern science places in our hand. The principal symptoms of the disease now ravaging Hong-Kong are the following: After a period of incubation, which lasts from three to five days (possibly a little longer, and some medical men say as long as eight days), the patient complains of high fever and swelling of one or more of the lymphatic glands (buboes). These swellings may antedate, coincide with, or follow the rise in temperature, and are accompanied by severe pain. The gland most commonly affected is one of the femoral chain; next an inguinal, next an axillary, and sometimes a cervical gland, is affected. The tongue is coated with a grayish-white or dark-brown heavy fur. There is commonly headache, also delirium; the heart is generally affected, and occasionally vomiting and diarrhea are present (the two last conditions are generally forerunners of a fatal issue). In patients who survive the onset of the disease the temperature does not fall until a week has passed, and convalescence is a slow process. Sex and age make no difference in the disease—men and women, infants and old people, are attacked equally. If in such a case as described the blood be examined, the previously described bacilli in greater or lesser numbers will be found present. (In 30 patients Kitasato obtained 25 positive results, and 2 of the subjects which were without bacilli were subsequently proved not to be suffering from the plague at all.)

Vibrio of Sputum.—Brix¹ describes a new form of vibrio found in the sputum of a case of pneumonia, which he terms “vibrio of sputum.” It is the size of the cholera-vibrio, is motile, has no spores, and tends to form chains. It is best stained with carbol-fuchsin, and does not take Gram’s stain. It grows on gelatin more rapidly than the cholera-germ; the gelatin is slowly liquefied. It is aerobic, does not produce indol, and coagulates milk with the separation of lactic acid. Its virulence is slight.

Madura Foot.—Boyce and Surveyor² describe the fungus of the streptothrix variety found by them in the lesion of fungus-foot-disease of India, or Madura foot. The organism resembles the actinomyces. It grows very slowly in most of the culture-media, and not at all in gelatin or broth. On potato and glycerol sugar-agar the growth is slow, occurring in the form of a whitish or pinkish, slightly radiate culture. The growth is brittle and firmly adherent to the medium at the margin, while the central part is loosely attached. The fungus grows best in oxygen at a temperature of 37° C.

¹ Hyg. Rundschau, Oct. 15, 1894.

² Brit. Med. Jour., Sept. 22, 1894.

In an atmosphere of hydrogen growth is excessively slow, thus differing from that of actinomyces, which grows readily in such an atmosphere. The organism stains easily with the ordinary anilin dyes and with Gram's method. The mycelial filaments are long and slender, do not divide dichotomously, and there are no septa; they are slightly thicker than those of actinomyces. Some are bulbous at the ends; spores were not observed, nor could any motion of the filaments be discovered. Inoculation-experiments have so far failed.

A New Streptothrix.—Salrazes and Rivi  re¹ report the finding of a new species of streptothrix in a case of cerebral abscess and suppurating renal infarct. The patient, a male aged thirty-two, was taken ill December 5th with a convulsion; at the end of about ten days he took to bed, having headache, vomiting, obstinate constipation, and emaciation; on December 26th he became aphasic; paralysis and anesthesia of the right leg and arm developed, with abolition of reflexes; no sugar or albumin was found in the urine, and the temperature was normal. A diagnosis of tuberculous meningitis was made. The patient died December 27th. No meningitis was found; the centrum ovale of the left hemisphere contained an abscess the size of a small mandarin-orange, filled with greenish pus. There was a small abscess in the apex of one lung and a purulent infarct in the right kidney, but no other lesion. In the pus from the brain and kidney the authors found a streptothrix consisting of branched filaments without dissepiment, and resembling the actinomyces, differing from the latter by the absence of granules in the pus, by the delicacy of the mycelium, and by its abundance in the abscess-cavity. It was not found in the suppurating focus in the lung. As other bacteria were also present, the exact pathogenic properties could not be determined; pure cultures were for the same reason not readily obtained.

A New Pathogenic Microorganism in the Rust-colored Sputum of a Case of Pneumonia is described by Bunze-Federn.² It has a variable form, occurring chiefly as a short rod with rounded ends, staining best at the poles. It does not color by Gram's stain, does not liquefy gelatin, and in bouillon causes a cloudiness, succeeded by transparency from settling of the growth. Spores were not observed; the organism is nonmotile. Rabbits die in from twelve hours to three days if the organism is subcutaneously introduced.

Thermophilic Bacteria.—Macfadyen and Blaxall³ publish a short paper on thermophilic bacteria, a term applied to those microorganisms that grow best at a very high temperature. Their experiments were made at temperatures ranging from 60   to 65   C., temperatures far removed from those in which saprophytic bacteria develop. Such bacteria were found in feces of man and the lower animals, in sewage, in Thames water and Thames mud, in the soil to the depth of five feet, in street-dust, in straw, and in seawater. The organisms may therefore be said to be ubiquitous. They grow rapidly at from 60   to 65   C., and can be obtained in pure cultures. All

¹ Presse m  d., Sept. 22, 1894.

² Arch. f. Hygiene, Bd. xix. Heft 3.

³ Brit. Med. Jour., Sept. 22, 1894.

of the organisms isolated were bacilli, and did not belong to one species; twenty different forms were isolated, and all without exception produced spores. Some were motile and some tended to form chains. The quickest growth was generally obtained on agar; the differentiation in pigment came out best on potato. The thermophilic bacilli did not grow at 22° C. nor at blood-heat. The first growth was obtained at from 40° to 42° C., and that in one instance only. The best temperature was 60° to 65° C. At 75° C. no growth took place. In regard to biology, it was demonstrated that some liquefy gelatin, others do not. A number curdled milk, and one bacillus converted starch into sugar. In some instances indol and hydrogen sulphid were produced. A certain number produced pink, yellow, or brown pigments. Several could be grown anaerobically as well as aerobically. It is an interesting question how these organisms exist under ordinary conditions in a climate the temperature of which is not that favorable to their growth. It seems that they must find conditions under which they are able to exist, and the authors suggest that the internal heat produced by the various fermentations taking place in organic nature supplies the necessary temperature, and they refer to the investigations of Schlösing, who found the temperature in fermenting manure to be from 42° to 52° C. The wide distribution and the active fermentative properties of the thermophilic bacteria point to their fulfilling some important function in the economy of nature.

A Study of Bacteria in the Blood.—A very valuable paper, from both the bacteriologic and the clinical standpoint, is published by Sittmann¹ on bacterioscopic blood-examination, including an experimental study concerning the elimination of staphylococci through the kidneys. The existence of bacteria in the blood in septic conditions has been noticed by a number of writers, but the negative results that have been published far outnumber the positive ones. The methods of the author differed from those of his predecessors in several respects. Instead of taking a single drop for the culture, as has been done heretofore, the author used large quantities obtained by puncturing a vein. For the culture 1 c.c. of blood was used and added to the liquefied medium, which was then poured into plates. The whole technique of the investigation is briefly as follows: 1. Ligation of the upper arm at the junction of the middle and lower third; 2. Disinfection of the skin of the elbow with soap and brush and mercuric chlorid, alcohol, and ether; 3. Puncture of the most prominent vein, basilic or cephalic, and aspiration of 5 c.c. of blood by means of a sterile syringe; 4. Transfer of 1 c.c. to each of three tubes containing liquefied gelatin or agar and to two bouillon-tubes. The tubes must be thoroughly agitated to prevent coagulation. The gelatin-tubes are emptied into Petri dishes, which are stood in the incubator at 22° C. The bouillon-tubes are kept in the incubator at 37°. Fifty-three cases of infectious diseases were investigated.

The first series includes 9 cases of primary septicopyemia. By this term the author denotes those cases of infection by pyogenic bacteria in which the

¹ Deutsch. Archiv für klin. Med., Sept. 4, 1894.

primary lesion that is the source of the general infection is produced by the same bacteria as those found in the blood, while a secondary septicopyemia is due to bacteria differing from those causing the primary lesion. By septicopyemic mixed infection the author understands a condition in which the primary disease and the blood-infection are produced by two or more varieties of bacteria. Of the 9 cases, the streptococcus pyogenes was found in the blood 4 times, the staphylococcus pyogenes 4 times—namely, the aureus once, the albus 3 times, and the staphylococcus albus and the bacillus coli once. All the streptococcus infections ended fatally, 2 of the staphylococcus, and the mixed infection. The conclusions from the first series of experiments are that in all cases of septicopyemia pyogenic organisms are demonstrable in the blood. Secondly, the circulation of pus-organisms in the blood does not necessarily imply an unfavorable prognosis. The latter depends upon the variety and the number of bacteria and upon the resistance of the organism.

The second series includes cases dependent on disease of the liver. The first case is one of cholelithiasis with febrile attacks. Staphylococcus pyogenes aureus was found in the blood during the febrile paroxysms. The second case was one of ulcerative cholecystitis dependent upon cholelithiasis and complicated with multiple abscesses of the liver. In the blood were found bacillus coli communis, staphylococcus pyogenes albus, and another staphylococcus. The presence of bacteria in the cases of fever connected with gall-stones is important, since it disproves the theory of Charcot and Schüppel that the intermittent fever in gall-stones is due to reflex causes. It proves that it is dependent upon infection.

In the third series the blood was examined in 16 cases of croupous pneumonia, with slight variations in the methods of technique. In 10 cases the examination was negative; in 6 pneumococci were found in the blood.

Of secondary septicopyemia dependent on typhoid fever 4 cases were examined. In 2 the blood contained staphylococci; in the other 2 it was sterile. The conclusion is drawn from this that the fever occurring in the decline of typhoid fever may be due to a secondary infection, but may also be dependent upon the specific nature of the disease itself without a secondary infection. The typhoid bacillus itself has been found in the blood (Meisels, Neuhaus, Rüttimeyer, Maragliano, and others).

Of secondary septicopyemia dependent upon tuberculosis 4 cases only were studied. In the 3 positive cases staphylococci were found.

Ten cases of articular rheumatism gave negative results; also 2 of scarlet fever, 2 of measles, and 1 of malaria.

Summing up, the 53 examinations gave 23 positive results. In 11 of these staphylococci were found, in 4 streptococci, in 6 pneumococci, and in 2 several bacteria. In the only other extended investigation of this kind, that of Canon, the streptococcus preponderated. The conclusion from these results is that an examination of the blood is of great diagnostic value in septicopyemia.

In the second part of the paper the author reports the results of experiments to determine the elimination of staphylococci with the urine. Rabbits were used in the experiments, and were injected in the vein of the ear with staphylococcus pyogenes aureus. After varying intervals the animals were slowly killed with chloroform, and cultures made from the arterial and venous blood obtained from the left and right ventricle and from the urine. The staphylococci were found in the urine. In the severe infection the bacteria appeared after eight hours, in lighter infection after five hours; and this condition was so constant that it was possible to predict the degree of virulence of the infection by the time of appearance of the bacteria in the urine. The elimination ceased, as a rule, after forty-six hours. The author concludes this portion of the paper with the statement that staphylococci can be eliminated with the urine without serious damage to the kidneys. [This is of importance from the standpoint of the practising physician, since it indicates that a stimulation of the renal function in conditions of septicopyemia in man may favor the elimination of the bacteria at the same time as it stimulates the discharge of the soluble poisons.]

Postmortem Bacteriologic Studies.—Wright and Stokes¹ have made a careful bacteriologic study of a large number of autopsies performed at the Boston City Hospital during a period of two years. For these studies the authors employed uniformly Loeffler's mixture, which was coagulated in the dry sterilizer at 80° or 90° C., and subsequently sterilized in the steam sterilizer during three successive days, as in the ordinary intermittent method.

Acute Lobar Pneumonia.—Autopsies were made in 42 cases, and the presence of the micrococcus lanceolatus demonstrated in 38. With the exception of 3 cases, in which the staphylococcus pyogenes aureus was also present (in 1 the streptococcus and staphylococcus), the micrococcus lanceolatus was found pure in all the cases or associated only with the bacillus coli communis or similar non-significant organisms. In the other 4 cases it is possible that the abundance of other microorganisms obscured the recognition of the micrococcus lanceolatus or prevented its development in culture if present. As to the occurrence of the lanceolate micrococcus in other organs in these cases of acute lobar pneumonia, the results were as follows: The micrococcus lanceolatus was found in the liver in 8 out of 26 cases examined; in the spleen in 6 out of 26; in the kidney in 11 out of 26; and in the blood of the heart in 3 out of 11. It is apparent, therefore, that the organism invades the tissues more widely than is generally supposed.

Pleuritides.—In 13 cases of fibrinous pleuritis accompanying acute lobar pneumonia the micrococcus lanceolatus was found in 12 in practically pure culture, the contaminating organism being usually the bacillus coli communis. In 4 cases of purulent pleuritis coincident with acute lobar pneumonia the micrococcus lanceolatus was present—in 2 cases with the staphylococcus pyogenes aureus. Of 3 additional cases of fibrinous pleurisy not accompanying lobar pneumonia the micrococcus lanceolatus was found in 2 (in 1 with the

¹ Boston Med. and Surg. Jour., March 21, 28, April 4, 1895.

staphylococcus pyogenes aureus) and the streptococcus in the third case. The micrococcus lanceolatus was also found in 2 out of 3 additional cases of purulent pleurisy not associated with lobar pneumonia—in 1 case with the streptococcus.

Acute Pericarditis.—In 7 out of 10 cases, 7 of which accompanied acute lobar pneumonia, the micrococcus lanceolatus was present. Of the 3 negative cases, the bacillus coli communis was found in 2, while the other was sterile.

Purulent Leptomeningitis.—In 8 out of 11 cases and 1 case of subacute type the micrococcus lanceolatus was present. Of the 3 remaining cases, the streptococcus was found in 1, and 2 were negative; but 1 of the latter was probably also due to the streptococcus, as that organism was found in the pus of the otitis media from which the infection had proceeded. Two of the micrococcus-lanceolatus cases were secondary to fracture of the base of the skull involving the petrous portion of the temporal bone, the brain being thereby placed in communication with the pharynx through the Eustachian tube, a pathway being thus afforded to the micrococcus lanceolatus, a common inhabitant of the throat.

Acute Endocarditis.—In 7 out of 10 cases the micrococcus lanceolatus was isolated from the vegetations or ulcerating tissue of the heart, in 1 case accompanied by the bacillus diphtheriae. Of the 3 remaining cases, the staphylococcus pyogenes aureus was present in 1, this organism and the streptococcus in the second, and unknown bacteria in the third case.

In all, 19 cases of acute endocarditis were studied with reference to the occurrence of bacteria in the internal organs. The micrococcus lanceolatus was found in the heart-blood or in some or all of the parenchymatous viscera in 7 cases. The combined results of these studies and those made of the heart-lesions gave an association of the micrococcus lanceolatus with 9 out of the 19 cases.

In addition to the foregoing cases of general infection with the micrococcus lanceolatus in acute lobar pneumonia and acute endocarditis, the same organism was found more or less widely distributed in a number of other cases.

A number of miscellaneous cases of general infection with the streptococcus are reported: 12 cases of puerperal infection were examined, in 9 of which the streptococcus was found in one or more of the internal organs. In many of the cases various other bacteria, as staphylococcus pyogenes aureus, micrococcus lanceolatus, and bacillus coli communis, were also present.

Of 7 cases of erysipelas, 6 were associated with the streptococcus, while in 2 there was in addition a general infection, considered secondary, with the staphylococcus pyogenes aureus.

Ten cases of general infection with the staphylococcus pyogenes aureus are reported. One of the cases was associated with general infection with actinomycosis. Case VI. was a case of carbuncle of the upper lip, with metastatic abscesses of the lung and kidney, and acute endocarditis. The

staphylococcus was found in the carbuncle, kidney, spleen, liver, lung, pericardium, and blood of the heart.

Interesting observations, confirmatory of those of Frosch, were made in diphtheria, of which 31 cases were studied. In 5 cases scarlet fever, and in 1 typhoid, were coincident. The bacillus diphtheriæ was found by culture in the lung in 30 out of 31 cases, in the liver in 9 out of 29 cases, in the kidney in 6 out of 31, in the spleen in 5 out of 31, in the blood of the heart in 5 out of 26, in the mesenteric lymphatic glands in 7 out of 16, in the cervical lymphatic glands in 4 out of 9, in the bronchial lymphatic glands in 2 out of 3, in the brain-tissue in 2 out of 5, and in the mucous membrane of the stomach in 3 cases. In 21 out of the 31 cases, or in nearly 70 per cent., a more or less general infection of the internal organs by pyogenic bacteria was found, the streptococcus being the one most frequently present.

Of the 31 cases, bronchopneumonia was present in 19. Cultures from the lung in these bronchopneumonias gave the following results: The bacillus diphtheriæ (not accompanied by other pyogenic bacteria) in 8 cases; the bacillus diphtheriæ and the streptococcus in 5 cases; the bacillus diphtheriæ, the streptococcus, and the staphylococcus pyogenes aureus in 2 cases; the bacillus diphtheriæ, the streptococcus, the staphylococcus pyogenes aureus, and the micrococcus lanceolatus in 1 case; the streptococcus (not accompanied by other pyogenic bacteria) in 1 case; and the bacillus diphtheriæ, the streptococcus, and the micrococcus lanceolatus in 1 case. From these results it is apparent that no one organism is to be regarded as the cause of the bronchopneumonia of diphtheria. In fact, some or all of these bacteria may be present in the lungs without the occurrence of bronchopneumonia.

Scarlet Fever.—Autopsies were performed on 11 cases, in 5 of which diphtheria was coincident. A well-marked general infection with the streptococcus was demonstrable in 4 cases; with the micrococcus lanceolatus in 1 case; and in another case, a polyinfection with the micrococcus lanceolatus and the staphylococcus pyogenes aureus.

Typhoid Fever.—Of the 9 cases that came to autopsy, the typhoid bacillus was found in the spleen in 7. In the 2 negative cases the failure to find the bacillus may be explained by the fact that both cases had entered the stage of healing. As to the distribution of the bacillus through the organs other than the spleen, the results were as follows: The typhoid bacillus was found in the liver in 4 out of 7 cases; in the kidney in 3 out of 7; in the blood of the heart in 2 out of 4; in the mesenteric glands in 3 out of 5; and in the bile in 2 out of 3 cases.

Bronchopneumonia and Focal Pneumonia.—Sixteen cases, exclusive of those associated with diphtheria and scarlet fever, were studied. In 8 of these the micrococcus lanceolatus was the only pathogenic organism present; in 2 the streptococcus; in 3 the staphylococcus pyogenes aureus; in 2 only the bacillus coli communis or various unknown bacteria grew in the culture. From these results it is clear that, as in the bronchopneumonia of diphtheria

and scarlet fever, the species of bacteria associated with pneumonic conditions other than the lobar type are subject to great variations.

Glanders.—Bonome¹ has drawn the following conclusions from his study of the glanders-bacillus: 1. It is present in the exudations and organs of affected animals, as well as in their urine and milk. 2. It can pass from the mother to the fetus through a healthy placenta, as also through one the seat of hemorrhages. 3. It is very susceptible to the influence of drying. It loses its virulence when kept in a dry state at a temperature between 25° and 30° C., in the absence of other organic matter, and ceases to develop if the drying process is continued for more than ten days. 4. If the drying is imperfect, as in an old agar-culture, the virulence is retained for several weeks. In distilled water the bacillus dies in from five to six days. 5. It offers a relatively great resistance to heat. 6. Cadaverin in the proportion of 1 in 40,000 or 1 in 60,000 causes the bacilli to grow in long filaments and robs them of pathogenic power. These effects are not transmitted to subsequent cultures in normal media. 7. The bacillus does not grow in the serum of a glandered horse, but assumes a kind of resting form. 8. In normal ox-serum the bacillus presents almost the same phenomena; this serum, filtered after prolonged contact with the bacilli, possesses curative properties against the disease in certain animals. 9. The serum of dogs collected during treatment with mallein is an unfavorable medium for the growth of the organism. This may explain the protective influence against the disease in this animal.

Tetanus.—Righi² has succeeded in growing the bacillus of tetanus anaerobically by frequently transplanting it from the highest parts of agar-cultures, where the bacillus is somewhat accustomed to the presence of a certain amount of oxygen. He was also able to grow it in the air on gelatin.

A method of obtaining pure cultures of the tetanus-bacillus, which is both simpler and speedier than those heretofore in use, is recommended by Frothingham:³ 1. Inoculate alkaline bouillon with the pus from the wound, or, pus being absent, with small bits of tissue from the inside of the wound, or, in experiment-animals inoculated with pure culture, with bits of tissue from the region of the point of inoculation. 2. Place tubes in an atmosphere of hydrogen and in the breeding-oven for forty-eight hours. 3. Examine microscopically, and if tetanus-bacilli are present, 4. Heat from forty-five to sixty minutes in a water-bath previously heated to 80° C. 5. From the heated tubes inoculate fresh bouillon, and place in the thermostat under hydrogen for forty-eight hours. 6. Test purity by microscopic examination and cultures in gelatin, agar, etc. 7. Test virulence on mice, white or gray.

The Bacteriopathology of the Tooth-pulp.—Miller⁴ has studied the pulps of 250 diseased teeth, finding that the degenerative processes in the pulp

¹ La Riform. Med., July 23, 1894.

² Ibid., No. 205, 1894.

³ Am. Jour. Med. Sci., May, 1894.

⁴ Centralbl. f. Bakteriologie u. Parasitenk., Bd. xvi., Nos. 10, 11, p. 477.

are, in the majority of cases, associated with mixed infection, cocci and bacilli being almost equally represented. Somewhat less frequently long threads and spirals are found. The bacteria find entrance into the pulp chiefly through carious dentine; infection through the circulation is conceivable, but must be rare. The pulp is predisposed to infection by the action of acids and ptomains on the dentine. Certain bacteria not capable of cultivation, as the spirilla and spirochetæ, play an important role in the diseases of the pulp. A number of cultivable bacilli have been found in the pulp, but are not pathogenic. The typical pyogenic cocci, staphylococcus and streptococcus, are but rarely found in pus in the pulp, but a number of cocci belonging to a group closely allied to the pyogenic organisms were found, and proved to be pathogenic for mice. The pneumococcus was not found. The existence of putrefactive processes in the pulp increases the activity of the micrococci of the pulp. The putrefactive processes in the pulp, which are always a dangerous source of infection, are to be attributed to the action of various kinds of bacteria. In addition to gaseous substances others of an obscure nature are also formed.

Acute Articular Rheumatism.—Sacaze¹ suggests that in many cases of acute articular rheumatism it is possible to find a local lesion, an injury, or a severe tonsillitis, through which bacteria, staphylococci, may have entered. He quotes the investigations of Saint-German, who was able to produce joint-effusions by intravenous injections of staphylococci of feeble virulence, although in the fluid no organism could be demonstrated, as has also often been noted in acute articular rheumatism. Bouchard and Charrin, on the other hand, claim to have found large numbers of staphylococci in the joints of persons suffering from acute rheumatism.

Streptococcus-angina.—Variot² reports an observation demonstrating the contagiousness of streptococcus-angina. In a family a little boy of three years developed a pseudomembraneous pharyngitis; then a sister of eleven was seized; and finally the mother, aged forty. The membrane in the case of the boy was not examined; in the mother and daughter it contained streptococci.

Erysipelas.—The identity of the streptococcus pyogenes and the streptococcus erysipelatosus is further proved by Reed,³ who reports an autopsy on a patient who had suffered from carcinoma of the liver, and who died of an attack of pneumonia. Examination of the organs revealed the presence of the diplococcus lanceolatus in the lung and a general infection of the organs with the streptococcus pyogenes. Dr. D. S. Lamb of the Army Medical Museum, while performing the autopsy, abraded his finger. Within twenty-four hours a local inflammation had set in, and in four days a typical facial erysipelas developed, which ended in recovery. As the patient on whom the autopsy had been performed was not suffering from erysipelas, and as Dr.

¹ Arch. gén. de Médecine, Nov., 1894.

² Jour. de Clin. Enfance; in Rev. mensuelle des Maladies de l'Enfance, Sept., 1894.

³ Boston Med. and Surg. Jour., Oct. 4, 1894.

Lamb's infection was clearly from this case, the identity of the two organisms is rendered very probable.

Another case confirming the identity of the two organisms is reported by Arnold.¹ A resident physician, while looking on at an operation for empyema in a child, was struck in the face by a fragment of rib as it was cut off by the bone-cutting forceps. He sustained a slight abrasion of the right cheek, which became the starting-point of a typical facial erysipelas. Cultures from the pus of the empyema revealed only the streptococcus pyogenes.

Roger² reports 10 cases of erysipelas complicated with another lesion; the latter, although apparently due to the cause of erysipelas, was really brought about by the pneumococcus. In 6 cases the complicating lesion was pneumonia, in 1 pneumonia and peritonitis, in 3 meningitis. In 3 cases the pneumonia was secondary to facial erysipelas, in 3 to erysipelas of the leg. In the other 4 cases the erysipelas was of the facial type. Three of the cases of pneumonia were fatal. The lesion is a bronchopneumonia, is insidious in its onset, and does not influence the temperature-curve to any marked extent. The pneumococcus could be demonstrated in the sputum, and, in the fatal cases, in the blood and organs. In 2 of the fatal cases the streptococcus was also present, but in small numbers. The meningitis may not manifest itself by distinct symptoms. In 10 of the cases the streptococcus was also found, but in small numbers. The different forms of meningitis cannot be distinguished clinically, but anatomically; that due to the pneumococcus is more fibrinous and drier, the exudate containing fewer leukocytes, while the streptococcus-meningitis is serous or purulent. But, as a rule, the differentiation can positively be made only by bacteriologic studies. The author believes that streptococcus-pneumonia is rare in erysipelas. The complications may be explained by assuming that the erysipelas favors the invasion of the system with the pneumococcus frequently present in the mouth. The association of the two organisms may also account for the peculiar character of the pneumonia.

Actinomycosis.—Lothrop³ reports 2 cases of actinomycosis hominis with postmortem notes. In the first case there were three sinuses opening on the chest which contained the characteristic sulphur-colored bodies. There was a thick pleural exudate and bronchopneumonia of the right lung with cavities, in which the characteristic pus was found. In the second case there was a sinus of the abdominal walls. The intestines, omentum, left ovary, uterus, and bladder were glued together by a plastic exudate. There were many small cavities in the mass connected by sinuses. The kidney, liver, and spleen were amyloid. The primary focus of infection was at the seat of a scar in the sigmoid flexure.

Mallory⁴ also reports a case of actinomycosis. There were adhesions of the pleural cavities in the lungs containing pus, and small foci of bronchopneumonia. The left lobe of the liver was a mass of necrotic tissue. The

¹ University Med. Mag., April, 1895.

² Rev. de Méd., April, 1895.

³ Boston Med. and Surg. Jour., March, 1895.

⁴ Ibid., p. 296.

kidneys contained abscesses, the pus of which was thick and yellow. There was also an abscess in the frontal region of the brain.

Blaxall,¹ in a bacteriologic study of 14 cases of suppurative ear-disease occurring as a complication in scarlet fever, found the following organisms:

<i>Streptococcus pyogenes</i>	12 times.	<i>Bacillus subtilis</i>	1 time.
<i>Bacillus striatus albus</i>	9 "	<i>Bacillus pyocyaneus</i>	1 "
<i>Staphylococcus pyogenes albus</i>	8 "	<i>Tubercle-bacilli</i>	1 "
<i>Staphylococcus pyogenes aureus</i>	5 "	<i>Yeasts</i>	6 times.
<i>Micrococcus albus liquefaciens</i>	3 "	<i>Sarcinae</i>	3 "
<i>Bacillus acidi lactici</i>	2 "	<i>Molds</i>	4 "

The case in which the tubercle-bacilli were found had suffered from otitis media before, the scarlet fever causing a recrudescence.

The author's conclusions are that—1. The organism most potent in the etiology of the otitis media of scarlet fever is the streptococcus. 2. The less chance there is of contamination from the outer air through the external orifice, the more the pyogenic cocci predominate over the rod forms, but prior to perforation of the membrane the occurrence of such organisms is not precluded, since they may ascend from the mouth and air-passages. 3. Next to the streptococcus, the most important organisms are the staphylococcus albus and aureus. 4. Apparently the diplococcus pneumoniae of Fränkel or the bacillus pneumoniae of Friedländer does not play such an important part in the otitis media of scarlet fever as in that due to other causes.

Growth of the Pneumococcus on Sputum.—Grawitz and Steffen² have studied the biologic behavior of the pneumococcus upon media prepared from various sputa. They found that, especially on pneumonic sputum, the pneumococcus always developed a capsule, even when the medium was inoculated with an unencapsulated culture on agar; further, that pneumococci grew very actively on this medium, so that cultures that had ceased to grow on agar presented a good growth on the sputum-medium. It is very noteworthy, also, that the pneumococci grown on sputum possessed full virulence, while attenuated cultures on transplantation to sputum regained their virulence to the fullest degree.

Pneumococcus as Cause of Peritonitis.—Le Gendre³ reports a case of peritonitis in a girl of eighteen; the pus was yellowish-green, lumpy, and of a fibrinous consistence, and contained a pure culture of the pneumococcus. The author found altogether but 11 cases recorded, 8 of which had been fatal.

Another case is reported by Veillon.⁴

The Pneumobacillus of Friedländer.—Dmochowski⁵ reports a case illustrative of the pyogenic properties of this bacillus. A patient of fifty-four died of an extensive suppurative process. At the autopsy there were

¹ Brit. Med. Jour., July 21, 1894.

² Berlin. klin. Woch., No. 18, 1894; Centralbl. f. Innere Med., Aug., 1894.

³ La Semaine méd., 1895, No. 7.

⁴ Centralbl. f. Allgem. Path. u. Path. Anat., Jan. 15, 1895, p. 33.

⁵ Centralbl. f. Bakteriolog. u. Parasitenk., Bd. xv. Heft 16.

found edema, abscesses of the right cheek, swelling of the mucous membrane of the right half of the nose. The antrum of Highmore, which was filled with pus, communicated with the orbit and the sphenoidal sinus. From the latter perforation had taken place into the skull. There were purulent meningitis of the base and the convexity, and an abscess in the right frontal lobe. In the pus of the abscess, in that of the sphenoidal sinus and of the antrum of Highmore almost pure cultures of Friedländer's diplococcus were found.

The Effect of Various Metals on the Growth of Certain Bacteria has been studied by Bolton.¹ It was found that those metals resistant to chemic reagents have no special influence, while those that are readily attacked by such agents have a marked inhibitory action on the growth of the bacteria. This effect is probably due to the solution of a minute quantity of the metal in the medium, and the placing of small bits of such a metal in the culture-medium is equivalent to the addition of a solution of the salt of the metal to it.

Influence of Light on Bacterial Chromogenesis.—McFarland² found that the chromogenic power of bacillus prodigiosus was not influenced by growing the bacteria in colored light.

Ward³ describes some of his experiments on the effect of light on the growth of bacteria. He found that the red, orange, yellow, and ultra-violet rays did not influence the growth, while exposure to the blue rays killed bacteria.

Thyroid-extract Culture-media.—Kopp⁴ has found that the culture-media containing extracts from the thyroid gland exert an inhibitory action upon the growth of certain bacteria, force some to take on peculiar characters, and have no influence upon others. Fresh sheep-thyroids were freed from fat, finely minced, and macerated for three hours in equal parts, by weight, of sterile water. The thin mush was strained through linen and filtered through porcelain to render it germ-free. The extract was then mixed with equal parts of a 20 per cent. watery gelatin solution containing 1 per cent. of salt. A 1 per cent. agar compound was prepared by adding the extract, warmed to 40° C., to a mixture of 2 g. agar, 6 g. glycerol, 1 g. salt, and 100 g. water, also warmed to 40° C.

The most interesting fact developed by cultivation on the modified medium was the difference presented by the growth of bacillus coli communis and bacillus typhi abdominalis. It consisted in a much more luxuriant development of the former. At the end of the fifth day the growth on thyroid-extract gelatin of the typhoid bacillus was in the form of a barely visible narrow veil, while that of the bacillus coli had formed a yellowish folded pellicle several millimeters thick and transversely striated. Preliminary boiling of the thyroid glands deprives the media of the power of thus influencing the growth of the bacterium coli.

¹ Internat. Med. Mag., Dec., 1894.

² Univ. Med. Mag., July, 1894.

³ N. Am. Pract., July, 1894.

⁴ Centralbl. f. Bakter. u. Parasit., 1895, xvii. 2, 3.

A New Culture-medium for the Bacillus of Diphtheria and Other Bacteria is suggested by Ball,¹ and termed by him *nutrient blood-coagulum*. It is simply animal blood placed in sterile test-tubes and heated in an inclined position on a water-bath until the blood is coagulated. The medium has a chocolate color, and brings out the colonies in strong relief.

A New Method of Preparing Transparent Culture-media is suggested by J. Lorrain Smith,² consisting in the addition of a small quantity of alkali to ordinary serum or white of egg. The mixture can be heated to a high temperature in the autoclave without becoming opaque. The addition of .1 to .15 per cent. of sodium hydroxid to ox-serum suffices for the purpose. Experiments have shown that a great many bacteria grow well on this medium.

Benzine as a Disinfecting Agent in making bacteriologic autopsies on small animals is suggested by Ohlmacher.³ The benzine can be used both in solution and for ignition. The advantages are that it is cheap, possesses active disinfecting power, and can be burnt off the surface of instruments without creating a great amount of heat. In the same paper Ohlmacher suggests the use of methyl-violet as an excellent stain for the diphtheria-bacillus. The dye should be obtained from Grüber, and is sold under the name of "Methyl Violet 5b." To make the staining solution, a saturated alcoholic solution of the dye is added to water in the proportion of about 1 to 10. The author having found difficulty in preparing the methylene-blue solutions for bacteria (such as the aqueous solution, Loeffler's alkaline solution, Gabbet's decolorizing solution), found that the methylene-blue used for staining after the method of Ehrlich gave better results than the methylene-blue of Koch.

To Stain Flagella.—Bunge⁴ suggests a method of staining flagella which is simpler than that of Loeffler. The mordant consists of concentrated aqueous tannin-solution, 3 parts, and 1 part of a 1:20 watery solution of liquor ferri chloridi. To 10 parts of this mixture 1 part of a saturated watery solution of fuchsin is added. The mordant improves with age. The bacteria are carefully fixed to the glass, and then stained for about five minutes with the filtered mordant, warming a little toward the end. Afterward the mordant is washed off, the specimen dried, and then stained with eosin-carbol-fuchsin.

Syphilis a Mycosis.—Van Niessen⁵ reported to the Society of Physicians of Wiesbaden a remarkable discovery that leads him to the belief that syphilis is a mycosis. In the blood and tissues of 6 recent and untreated cases of syphilis (in the urine of 2 of them) he found a species of penicillium both by microscopic examination and by cultivation.

VACCINIA AND VARIOLA.

Buttersack⁶ found highly refractive fibrils in vaccine-lymph, the nature

¹ Med. News, Nov. 24, 1894.

² Brit. Med. Jour., June 2, 1894.

³ N. Y. Med. Jour., March 2, 1895.

⁴ Fortschritt. der Med., Bd. xii., 1894, No. 12.

⁵ Brit. Med. Jour., Epit., 347, Nov. 3, 1894.

⁶ Berl. klin. Woch., 1895, No. 12.

of which is as yet not determined. They were best brought out by treating the cover-glass with 1 : 20 normal sodium hydroxid solution, washing with distilled water, and staining with a 1 : 5 Ziehl's solution. The peculiar fibrils were not stained.

Clarke¹ found in fresh vaccine-lymph large oval and pyriform bodies that did not resemble any known stage of cell-degeneration. The bodies are granular or reticular, highly refracting, and contain a nucleus surrounded by a clear space. When stained they resemble the bodies described as parasites in carcinomata and sarcomata.

Clarke² claims also to have found sporozoa in variola and vaccinia. If the cornea of a rabbit or guinea-pig is inoculated with active vaccine-lymph, cell-infection occurs very promptly. If the animal is killed forty-eight hours after vaccination, the cornea immediately excised and placed in mercuric chlorid and stained in the usual way, the sections reveal minute, highly refracting bodies lying within the deeper cells close to the nuclei. They stain deeply with hematoxylin, and better even with carmin, eosin, and acid-fuchsin. There is nothing in these bodies that excludes the possibility of their being due to degeneration but the fact that ameboid movement has been observed in them, and that they are dependent upon a previous vaccination renders it probable that they are true parasites. In the contents of variola-vesicles and in the skin of persons dead of small-pox the author found bodies identical in structure with those in the vaccinated cornea. The author states that the process which takes place in the vaccinated cornea and in the other lesions of vaccinia and small-pox resembles in a remarkable degree that observed in carcinoma.

Kent³ in examining vaccine-lymph and the vaccination-vesicle found a bacillus occurring in colonies of from ten to fourteen individuals, with rounded ends that were stained more deeply than the center. In the tissues the bacillus is similar, but smaller. It may be found within the cell. Cultures of the bacilli inoculated into calves produce a vesicle very like that caused by a normal lymph.

Copeman,⁴ in a discussion on the pathology of vaccinia, states that on the strength of his own experiments, as well as those of Klein and others, he considers it as proved that small-pox lymph, by residence in the tissues of the calf, can be so attenuated and altered in character as to become deprived of its power of causing a generalized eruption, and, more important still, that by such treatment it loses its contagious nature, while causing at the site of inoculation what is indistinguishable from a typical vaccine-vesicle. These facts force the conclusion that vaccinia is a modification of, if not identical with, variola, especially as these two diseases exert a mutually protective action against each other.

In regard to the bacteriology of vaccine and variolous lymph, the author believes that the protozoa described by Pfeiffer and others are degenerations

¹ Med. Press and Circular, July 25, 1894.

² Lancet, Jan. 19, 1895.

³ Brit. Med. Jour., Sept. 22, 1894, p. 633.

⁴ Brit. Med. Jour., Sept. 22, 1894.

of epithelial cells. He himself has found in vaccine-lymph a small bacillus, which is most abundant in lymph taken on the fourth or fifth day from the calf. Klein has also found a bacillus in vaccine-lymph which seems, according to the author, to correspond in all respects with the one found by himself, and which was first discovered in variolous lymph by Besser. Both Klein and the author were able to demonstrate the presence of the bacillus in the tissues themselves—that is, in sections of the vaccine-vesicles. Up to the present the organism has not been cultivated on artificial media.

THE TUBERCLE-BACILLUS.

Tubercle-bacilli in the Nasal Cavity.—Straus¹ has demonstrated the existence of virulent tubercle-bacilli in the nasal cavities of persons who, though healthy or suffering only from some chronic nervous disease, had occupied the same wards with tuberculous patients or were physicians to such patients. In none was a trace of tuberculosis discovered. The bacilli were found in 9 out of 29 cases examined. The experiments were conducted as follows: The whole nasal cavity was swabbed out with pledgets of sterile cotton; these were shaken in sterilized bouillon or water, and this then injected into the peritoneal cavity of guinea-pigs. Seven animals died of septicemia; 13 remained well, and when killed showed no signs of tuberculosis; in 9 cases, or nearly a third, the animals died or were killed in from three to five weeks, and presented tuberculous lesions in which the bacilli could be demonstrated.

Tuberculosis of the Placenta.—Schmorl and Koekel² publish a contribution to the subject of tuberculosis of the human placenta in relation to congenital tuberculosis. They refer to Lehmann's recent observations, which have shown that in acute miliary tuberculosis during pregnancy the placenta may be affected with tubercle as well as the other organs. It is also probable that in cases of advanced pulmonary tuberculosis the placenta may become involved, for it is not unusual to find tubercles in such cases in other organs than the lung, such as the liver, kidney, and spleen. Gärtner has experimentally demonstrated that in pregnant animals with pulmonary tuberculosis the fetus not rarely contains tubercle-bacilli. The authors describe 3 cases bearing on this subject: 1. A woman of twenty-six, in whom the autopsy revealed acute miliary tuberculosis. She was in the eighth month of pregnancy. Cesarean section was performed during the death-agony, but the child died two hours after the operation. 2. A woman of twenty-five who died during pregnancy of acute miliary tuberculosis. 3. A pregnant woman who suffered from laryngeal and pulmonary tuberculosis, and who died suddenly from hemoptysis. Cesarean section was performed soon after death, but the child was already dead. In all 3 cases tubercles were found in the placenta; very few in Case 3, and less in the placenta than in the other organs in the other 2 cases. The bacilli in all the cases probably reached

¹ Archives de Méd. expér. et d'Anat. path., 1894, vi., No. 4, p. 633.

² Beiträge zur Path. Anat., xvi., part 2.

the placenta through the blood, although in Case 2, in which there was also tuberculous peritonitis, they might have, although this is less likely, been carried to the uterus by the Fallopian tubes. In cases of miliary tuberculosis the bacilli may be distributed equally to all parts of the body, and the only way to explain why in Cases 1 and 2 fewer tubercles were found in the placenta than in other organs is to assume that the placenta offers greater resistance to the growth of the bacillus. In all the 3 cases the fetal placental villi contained tubercle-bacilli, but only in Case 2 were any found in the organs of the fetus; and even in this case they were only discovered by microscopic examination in the liver and in a lymphatic gland in the neighborhood of the liver. The reason why only a few bacilli had passed into the fetal circulation is, in the opinion of the authors, to be found in the structural changes present in the vessels of the tuberculous villi. These changes consisted in the formation of hyaline thrombi and the hyperplasia of the endothelium, a barrier being thus formed against the spread of tubercle to the fetus.

Absence of Tubercle-bacillus from Healthy Genital Tract.—Walther¹ did not find tubercle-bacilli in the healthy genital apparatus of a single phthisical cadaver.

Infection by Food.—Woodhead² directs attention to the frequency of tuberculous infection with the food. The protection to the organisms offered by the lymphoid rings guarding the pharynx and esophagus and the abundant lymphadenoid tissue in the intestines is exceedingly great, but these structures may, instead of protecting, become the avenue of entrance of the infection. Thus it is often possible to trace the process of infection from the tonsils to the glands of the neck, thence to the mediastinal and poststernal glands, and through the intercostal lymphatics and glands. Infection has also been traced from old calcified mesenteric glands to the glands of the mediastinum, and thence to the lung. In some instances food is carried directly to the lungs and causes infection. In the cases in which the tonsils are not tuberculous, while the lymphatic glands connected with them are affected, it is to be assumed that after injury of the mucous membrane the tubercle-bacillus gained entrance, was carried by phagocytes to the neighboring glands, and set up the changes which the phagocytes were unable to resist or prevent.

The author commends the wisdom of the Danish government, which placed a large sum of money at the disposal of the chief veterinarian, Dr. Bang, for the systematic inspection and the disposal of tuberculous cattle. For the diagnosis of the disease tuberculin is an agent of inestimable value.

Infection by Tattooing.—Collins and Murray³ report 3 cases.

Immunity to Tuberculosis in Guinea-pigs.—De Schweinitz⁴ has used attenuated cultures of the tubercle-bacillus to confer immunity on guinea-pigs against active virus. The bacillus was attenuated by being grown for many

¹ Ziegler's Beiträge, xvi. 2.

² Brit. Med. Jour., June 1, 1895.

³ Lancet, Oct. 27, 1894.

⁴ Med. News, Dec. 8, 1894.

generations (14-20) on glycerol beef-broth. Guinea-pigs inoculated with such cultures remained well after being inoculated with material from a tuberculous gland, while the check-animals died in seven weeks. Guinea-pigs that had been fed with tuberculin also resisted the inoculation of the tuberculous material. A calf that had received 100 c.c. of a liquid culture of the attenuated germ of the twentieth generation failed to respond to tuberculin three months later, and was killed. The autopsy showed the animal to be perfectly healthy. [The importance of these experiments can as yet not be estimated. As the author says, the attenuated germ may possibly prove very valuable in checking or controlling tuberculosis in animals, especially cattle. There is, it seems to us, no reason why the method may not, in some form, be applicable to human tuberculosis.]

The author has succeeded in growing the tubercle-bacillus on a medium free from albuminoid matter. Its composition is as follows:

Water,	1000 c.c. ;
Glycerol,	70 g. ;
Acid potass. phosph.,	1 ;
Ammonium phosph.,	10 ;
Sodium chlorid,	10 ;
Asparagin,	3 ;
Magnesium sulphate,	0.2.

Toxic Products of the Tubercle-bacillus.—Maffucci¹ reports the results of many experiments relating to the toxic products of the tubercle-bacillus. He concludes that cultures of tubercle-bacilli in which the bacilli are dead contain a toxin resistant to time, heat, desiccation, sunlight, and the gastric juice. This toxin is derived from the bacilli, and is set free by their disintegration. It is not the result of secretion of the bacilli, nor does it originate in the nutrient medium. The toxin is powerful in its action, a minute dose being sufficient to cause marasmus. It may pass from mother to fetus without the transmission of the bacillus, and can cause abortion. If the fetus is born alive, marasmus is apt to develop. The milk may also contain the toxin. When concentrated it is capable of causing tuberculous abscesses. In diluted solutions disturbances of circulation and catarrhal inflammations are set up, while the red corpuscles in the blood become altered. It may cause parenchymatous nephritis or fatty degeneration of the epithelium of the kidney if allowed to pass repeatedly through this organ.

Effect of Putrid Sputum on the Bacillus.—Perrando² examined tuberculous sputa and other tuberculous products after they had become putrid with a view of determining the effect upon the bacillus of tuberculosis. The matters became putrid in from two to six days. The bacillus was found perhaps more readily than in fresh sputum. After twenty to forty days it stained less easily and became granular; after from forty to sixty days it

¹ Il Policlinico, Jan. 1, 1895.

² La Riform. Med., Feb. 18, 19, 1895.

could not be recognized. The author also states that tubercle-bacilli are often found in the tympanic cavity of the ear, being possibly driven up the Eustachian tube during fits of coughing.

Alleged Pleomorphism of the Tubercle-bacillus.—Jones¹ has observed in sputa of tuberculosis peculiar forms of microorganisms resembling the actinomyces fungus; he concludes, however, that the clubbing of the ends in the one, as in the other, is not due to swelling of the terminal filaments, but is inorganic in origin, the result of a chemie reaction between the organism and its environment. We infer from the very long but obscure paper that the author is inclined to place the tubercle-bacillus among the pleomorphic saprophytic organisms. He describes five phases in the developmental cycle of the bacillus: 1. In the tissues and secretions it occurs in the form of short or long rods that propagate by transverse fission. 2. Occasionally one finds in secretions (sputum), and always in old agar-cultures, filamentous forms that (*a*) are not demarcated, and (*b*) show true branching. 3. The thread-like forms are present only on the surface of the culture-medium. In the deeper parts, as also in the tissues and in fluids (localities deficient in oxygen), only the short rods are produced. 4. The rods do not contain such spores as are found in other bacilli, but both in the rods and in the threads bodies are found which in their physical properties resemble spores, differing, however, in many respects from typic endospores. 5. Under certain conditions one finds in closest association with the tubercle-bacillus forms that present the same structural peculiarities as the clubbed forms of actinomyces.

Action of Heat upon the Bacillus.—McFarland² has repeated the experiments of Marpmann³ which led the latter to predicate the existence of permanent forms of the tubercle-bacillus resisting exposure to heat, and finds that tubercle-bacilli, as well as those isolated segments that Marpmann considered permanent forms, are invariably killed by boiling.

Symbiosis of the Tubercle-bacillus and the Lepra-bacillus was found by Phillipson⁴ in a leprous girl of twelve years. The author holds that it is important to search for the tubercle-bacillus in every case of leprosy.

A Method for the Examination of Tubercle-bacilli is proposed by Van Ketel,⁵ which is both simpler and more certain than that of Biedert: Ten c.c. of water and 6 c.c. of liquid phenol are placed in a wide-mouthed bottle of 100 c.c. capacity. Ten c.c. of the fluid to be examined are added, the bottle closed with a rubber stopper, and well shaken for one minute. Milk and very thin sputum are shaken with 6 c.c. of phenol without further dilution. After sufficient shaking the bottle is filled with water and shaken again, and the fluid poured off into a conical glass. The bacilli rapidly sink to the bottom, and some of the sediment can be drawn off in twelve to twenty-four hours and spread on a cover-glass. The dried and fixed cover-glass is dipped in ether or chloroform and washed in alcohol, or is at once

¹ Centralbl. f. Bakt. u. Parasitenk., 1895, xvii. 1, 2, 3.

² Univ. Med. Mag., Sept., 1894.

³ Centralbl. f. Bakteriologie u. Parasitenk., Aug., 1893.

⁴ Virch. Arch., cxxxii.

⁵ Arch. f. Hygiene, 1894; ref. in Fortschritte der Med., No. 18, 1894, p. 720.

washed in alcohol and ether, particularly when the preparation is thick. The bacilli are then stained by Ziehl-Neelsen's method.

THE DIPHtheria-BACILLUS.

Persistence of the Bacillus.—Abel¹ found virulent diphtheria-bacilli sixty-five days after the disappearance of a pharyngeal diphtheria. The cause of this long persistence was the extension of the disease-process to the nose. The author points out the important fact that nasal diphtheria may cause no more marked symptoms than a simple coryza, and that patients, not thinking it necessary to consult a physician, may readily convey the disease to others.

The Bacilli found in a Wound.—Abel² found diphtheria-bacilli in the false membrane that had developed in the wound of a finger of a young girl suffering from diphtheria. The bacilli were of a slight degree of virulence.

Septic Diphtheria.—Generisch³ has studied septic diphtheria bacteriologically. Of 21 cases of pure infection, 5 presented septic symptoms. He concludes that the diphtheria-bacillus is capable of producing marked septic phenomena, and suggests as a more appropriate name "grave toxic diphtheria," instead of septic diphtheria. [It is interesting to note that the existence of a "septic diphtheria" was already recognized by Trousseau, the pupil of Brétonneau, who described it under the name of *diphthérie maligne*.]

A Study of Diphtheria.—Wright's⁴ studies of 82 cases are divided into five series, as follows: 1. The study of the virulence of the bacillus diphtherie in infections of the pharynx and air-passages of varying degrees of severity and duration; 2. The results of autopsies on diphtheria-cases; 3. The pathologic anatomy and bacteriology of experimental diphtheria; 4. Cases of infection of various ulcerating surfaces and other inflammatory processes with the Klebs-Loeffler bacillus, as well as some other instances in which it has been isolated; 5. On the morphology and biology of the Klebs-Loeffler bacillus.

Of the 82 cases, 59 presented varying degrees of severity. The cultures were taken at an early period of the disease, when the organism could have been considered as not having been present a long time in the throat. The second series comprised 23 cases in which the bacillus had been present in the throat for a longer or shorter period of time when inoculated into guinea-pigs. Of the first 59 cases, 28 were fatal and 31 ended in recovery. Of the 28 fatal cases, cultures from 22, or 79 per cent., caused the death of at least 1 animal within three days, while of the 31 nonfatal cases, 23, or 74 per cent., had this effect. It may therefore be considered as a fact that virulent cultures are only a little less frequently found among the nonfatal cases than among the fatal.

¹ Deutsch. med. Woch., Aug. 30, 1894.

² Ibid., June 28, 1894.

³ Jahr. f. Kinderheilk., xxxviii. Heft 2 u. 3; ref. Hyg. Rundschau, iv. 22, Nov. 15, 1893.

⁴ Boston Med. and Surg. Jour., Oct. 4 and 11, 1894.

Of the 23 cases in the second series, cultures from 11 caused the death of the guinea-pig in less than three days, or 48 per cent. gave full virulent bacilli. From these 82 cases the following conclusions are drawn: 1. There is practically no difference in virulence between bacilli derived from severe and mild cases of diphtheria. 2. Cases in which the Klebs-Loeffler bacilli had been present for a longer or shorter time furnish fewer virulent cultures than cases of recent beginning. 3. The Klebs-Loeffler bacillus does not, as a rule, lose its virulence by long-continued residence in the pharynx and air-passages. The bacillus exists with all degrees of virulence down to innocuousness, as far as is shown by the results of the author's inoculations in the guinea-pig, and the intensity of the reaction in the animal bears no constant relation to the symptoms presented by the case from which the bacillus was isolated. 5. There is no relation between the age and sex of the patient and the virulence of the bacillus.

Fourteen autopsies were made on cases of diphtheria. In these the bacillus was found in the lung in 13 cases, in the liver 3, in the spleen 2, in the cervical or bronchial lymph-glands in 5, in the kidney in 1, in the mesenteric lymph-glands in 2, in the mucous membrane of the stomach in 2, in the edematous tissue behind the esophagus in 1 case. In 7 out of 12 cases, or in nearly 60 per cent., there was a streptococcus-septicemia in addition to the diphtheric infection. Bronchopneumonia was present in 10 of the 14 cases. The occurrence of the Klebs-Loeffler bacilli in the lung appears to be independent of the coexistence of this lesion, for it was absent in one bronchopneumonia, and present when no pneumonic condition was made out.

The third portion of the work describes the pathology, anatomy, and bacteriology of experimental diphtheria.

The fourth section deals with the Klebs-Loeffler bacillus in its relation to ulcerated surfaces and other lesions of the body. The conclusion is reached that any excoriated or ulcerated surface on the body of a diphtheric patient will usually be found to be infected with the bacillus of that disease.

Regarding the morphology of the diphtheria-bacillus, the author believes that there are two forms. The more common is distinguished by being a more or less segmented rod with intensely staining ends, and perhaps one or two sharply-defined, intensely stained areas between. The other form is much longer and much more segmented, often somewhat contracted at the middle and gently swelling toward the ends, one of which may be somewhat thicker than the other. The long form presents usually two slight curves. The long form has only occurred in a small proportion of the cases, and does not change in successive cultures. The author has never observed a change of reaction from the acid back to the alkaline in old cultures.

[There is now abundant evidence of the general distribution of the bacillus diphtheriae through the body in fatal cases of diphtheria. Frosch found it in 10 cases out of 15 in the spleen, kidney, blood of heart, pericardial and

pleural fluid, brain, and liver. Emmerich found it in the kidneys of 2 fatal cases. Whether this distribution is an important factor in the disease or not is still a matter of doubt.]

Cultures from the Kidneys and Spleen were made by Reiche¹ in 42 cases of diphtheria, in all of which the Klebs-Loeffler bacillus was found in the throat, usually together with cocci and other bacteria. The diphtheria-bacillus was found twice, the streptococcus in 19, the streptococcus and staphylococcus in 7, and in 2 cases the staphylococcus and streptococcus in combination with a bacillus, probably bacillus coli; in 13 cases the tubes remained sterile.

The Bacillus in Lobar Pneumonia.—Ohlmacher² reports the discovery of the diphtheria-bacillus in the affected lung of a case of lobar pneumonia complicated with purulent meningitis. No examination was made at the autopsy of the mouth or throat, but there had been no symptoms during life pointing to any affection of those parts. The bacilli were discovered accidentally in tubes of Loeffler's blood-serum mixture inoculated at the autopsy.

The Bacillus in Healthy Throats.—Adams³ found Klebs-Loeffler bacilli in 7 out of 52 healthy throats of children, and in 10 out of 28 cases suffering from measles. Only 1 of these cases developed true diphtheria. The inoculations were made by Adams, and the tubes sent to the N. Y. Board of Health, where they were examined by Dr. Park.

The Bacilli in Floor-sweepings, etc.—Wright and Emerson⁴ made a study of the dust upon the floor of the diphtheria-pavilion of the Boston City Hospital and of the persons and clothing of the attendants, to determine whether the diphtheria-bacilli occurred outside of the body. In four cultures from floor-sweepings, from the brush, and the cloths used in dusting, one (that from the brush) gave diphtheria-bacilli. Three cultures in four made from the dust of the attendants' shoes showed bacilli. Cultures from the hair of the attendants gave positive results in one. Examinations of the margins of the dresses, the bedding, the finger-nails of the attendants, and the air gave negative results.

Symbiosis.—Heilström⁵ shows that the virulence of the diphtheria-bacillus is influenced by its symbiosis with other microorganisms; it is apparently greater when the streptococcus than when staphylococcus is present. He observed an epidemic of diphtheria in a children's home. In all of the 28 cases staphylococcus pyogenes aureus was associated with the Klebs-Loeffler bacillus. There was 1 fatal case. The author supposes that there was in this epidemic a primary coccus-infection, to which the diphtheria-bacillus was added secondarily, and is inclined to believe that such a mixed infection is often of good prognostic significance.

¹ Centralbl. f. Innere Med., Jan. 19, 1895.

² N. Y. Med. Jour., April 27, 1895.

³ Med. Rec., New York, Sept. 29, 1894.

⁴ Centralbl. f. Bakteriologie und Parasitenkunde, Sept. 18, 1894.

⁵ Hygiea, 1894, Heft vii. p. 46; Centralbl. f. Bakteriologie und Parasitenkunde, 1895, xvii. 37.

THE TYPHOID-BACILLUS.

The Relation of the Typhoid Virus to Human and Experimental Typhoid Fever is studied by Sanarelli,¹ who comes to these conclusions: 1. The bacillus of Eberth gives rise to a substance toxic to the nervous system and causing collapse and death. 2. The toxin has a decided action on mucous membranes, particularly the intestinal, causing venous congestion, round-cell infiltration, hypertrophy of Peyer's patches, and edema of the epithelial elements, with desquamation of epithelium, hemorrhages, and ulceration. 3. These changes are associated with symptoms resembling human typhoid fever. 4. In experimental as well as in human typhoid the lesions seem to be due to the toxin, as the bacillus is not found in the contents of the intestine, proving that the disease is not an infection with localization in the intestines. 5. The absence of the bacillus from the intestines is explained as follows: The disease being an infection of the lymphatics, the bacillus is localized there; secondarily, the bacillus coli communis develops rapidly, and destroys every other microorganism of the intestines. 6. The secondary infection is due to the rapid development of the colon-bacillus, both in experimental and human typhoid. 7. The emigration of the bacillus coli into the general circulation occasions chronic inflammation of the serous membranes, but not a general infection. The local character of the infection depends on the immunity to typhoid fever which the animal has acquired. 8. Animals become immune against the bacillus coli when vaccinated against the typhoid bacillus. The bacillus coli in such cases disappears from the intestines, being probably destroyed by the epithelial cells of the mucous membrane, which act as phagocytes. This last is Metschnikoff's view.

Action of the Typhoid Toxin.—Sanarelli² has made a careful study of experimental typhoid fever produced by the typhoid toxin. He finds that the symptoms and anatomic lesions caused by the toxin are the same as those resulting from the introduction of the bacillus. The toxin was prepared as follows: A very virulent culture was obtained by passing the microorganism through a series of guinea-pigs, and from the peritoneal exudate of the animals killed by this virus in a few hours flasks of glycerol-bouillon were inoculated. The flasks were kept at 37° C. for about a month, then sterilized, and left at ordinary temperatures for eight months, at the end of which they were hermetically sealed and kept for a few days at 60° C. The liquid divided into two layers, of which the upper was clear. This was decanted and tested. The author's conclusions are that Eberth's bacillus, after its entrance into the organism, elaborates a toxin that acts on the nerve-centers, causing collapse, and this toxin also produces the intestinal lesion.

For the Rapid Detection of the Typhoid-bacillus.—Lyonnet³ gives the following method: The ordinary bouillon is taken and decolorized with animal black, and 1 per cent. of phenic acid and 20 per cent. of lactose added,

¹ Am. Med.-Surg. Bull., Aug. 1, 1894.

² Ann. de l'Inst. Pasteur, April, 1894.

³ La Sem. méd., Nov. 3, 1894.

with a small quantity of Congo red. The presence of the phenic acid permits only the typhoid-bacillus and the bacillus coli to grow in the medium. If the typhoid-bacillus is present, the milk-sugar does not ferment—the bouillon becomes cloudy, but remains red. If the bacillus coli develops, the bouillon becomes cloudy, the milk-sugar is converted into lactic acid, which changes the color of the bouillon from red to violet. If the broth remains clear, neither of the organisms is present; if it becomes turbid, but remains red, the typhoid-bacillus is probably present: turbidity with a change of color to violet indicates the presence of the bacillus coli communis.

Pseudotyphoid.—Banti¹ describes under the head of “pseudotyphoid” a disease of which several instances were observed in the same family, and which in its clinic symptoms resembled typhoid fever so closely as to be practically indistinguishable from it; only the rash was absent. In the one fatal case the bacilli were absent from the blood and exudations. The spleen and the solitary follicles of the intestine were enlarged. There was no intestinal ulceration, but an intense enteritis.

In another case reported by the same author the patient presented the typic typhoid facies, with dry tongue and delirium, while the rash, the diarrhea, splenic tumor, and meteorism were absent. Postmortem nothing was found but a minute ulcer in the end of the duodenum. From the blood and juices typic cultures of the typhoid-bacillus were obtained. The reason for the absence of the typic symptoms is not readily discovered, but the author suggests that the body may have become infected through the duodenal ulcer, a septicemia resulting instead of the usual intestinal lesion.

Longevity of the Bacillus.—By cultural methods Buschke² was able to demonstrate the existence of living typhoid-bacilli in an abscess of the ribs, although seven years had elapsed since the attack of typhoid fever. The bacilli had almost lost their virulence, but soon regained it by remaining in the animal body one or two days, and then being transferred to artificial media.

Typhoid-bacillus in Laryngeal Ulcers.—Cheyne³ reports a case of typhoid fever with ulcers on the vocal cords and arytenoid cartilages. He was able to demonstrate by cultivation the presence of typhoid bacilli in the laryngeal lesions.

THE CHOLERA-VIBRIO.

The Effect of Different Bacteria upon the Cholera-vibrio has been studied experimentally by Metschnikoff.⁴ Sarcina and torula favored the development, while the bacillus pyocyaneus and a certain coccus isolated from the air prevented entirely the development of cultures. Metschnikoff then introduced into rabbits first a mixture of sarcina, torula, and a bacillus of the colon-bacillus group, and immediately afterward a culture of the cholera-

¹ La Rif. Med., Sept. 6, 1894.

³ Brit. Med. Jour., Dec. 15, 1894.

² Fortsch. d. Med., Nos. 15 and 16; 1894.

⁴ Wien. med. Presse, No. 39, 1894.

germ. Two out of 22 animals survived, while the remaining died in from thirty-six to forty-eight hours. Control-animals died in about six days after the introduction of the cholera-vibrio. Metschnikoff concludes that the bacteria of the digestive tract influence the susceptibility of man to the cholera-vibrio.

The Comma-bacillus and the Bacillus Coli.—Kempner¹ was unable to confirm the statement of Gabritschewsky and Maljutin that the preponderance of comma-bacilli in the stools of cholera-patients over the bacillus coli was due to an antagonism between these bacteria. Neither in bouillon nor in egg-culture could any such influence be demonstrated. The writer concludes that the bacillus coli is washed out by the profuse discharges, and that its growth is interfered with by alterations of the soil produced by the growth of the cholera-vibrio.

Laboratory-infection.—Reinecke² reports a very sad case of fatal cholera-infection in the laboratory. Dr. Oergel, an efficient assistant in the Hamburg Hygienic Institute, was engaged in a study of cholera, and infected himself in some obscure way which could not be distinctly ascertained. It seems, however, that some of the peritoneal fluid of a control-animal entered his mouth. He is said not to have rinsed the buccal cavity until after he had prepared a hanging drop. The patient's stools contained typic cholera-bacilli. Death occurred on the sixth day in coma. The pathologic diagnosis was as follows: Fibrinous pneumonia of both lower lobes; old endocarditis of aortic valve; cholera-kidney (second stage); recent swelling of the liver; diphtheric colitis and proctitis.

Growth in Eggs.—Abel and Draer³ have repeated the experiments of others (Hueppe, Gruber, Hammerl, etc.) on the growth of the cholera-vibrio in chicken-eggs, and come to the following conclusions: 1. The egg is a very unfavorable culture-medium, as the majority of cultures become contaminated either by the penetration of germs through the shell or by their entrance into the egg at the time of its formation. 2. Eggs the yolks of which are yellow, as well as those in which the latter are greenish-black, may contain pure cultures of the cholera-vibrio, but in both instances other germs may also be present. 3. The discoloration of the yolk varies with the age of the culture and the quantity of germs introduced. 4. The power to color the yolk black varies with the stock-culture—*i. e.* germs from one source have a greater power in this direction than those from another. 5. The main reason for the difference in color seems to reside in the condition of the eggs themselves. 6. H₂S may or may not be developed by the cholera-germ in the egg-culture.

Bacteriologic Study.—Diatroptoff⁴ studied bacteriologically 5 cases of cholera that occurred during an epidemic in Odessa, in Nov. 1893. Cultures

¹ Centralbl. f. Bakteriöl. und Parasitenk., 1895, xvii. No. 1.

² Deutsch. med. Woch., Oct. 11, 1894.

³ Zeitsch. f. Hygiene und Infektionskrankh., Bd. xix., 1895, p. 61.

⁴ Deutsch. med. Woch., Bd. xxxv., 1894, p. 691; Centralbl. f. Bakteriöl. u. Parasitenk., Jan. 26, 1894.

were taken from the lung, liver, kidney, spleen, and blood of the heart. In 1 case examination of the blood was omitted. In only 1 case did the blood give a positive result. From the lung and liver cholera-bacilli were obtained in all of the 5 cases; from the spleen and kidney in 3 cases. The majority of the cultures were contaminated with other bacteria, the nature of which was not determined. In the intestinal tract pure cultures of cholera-bacilli were present. The discovery of cholera-bacilli in the various organs is, according to the author, probably connected with the fulminant course which these cases had taken.

The Pathologic Changes produced by Cholera in the Female Generative Organs has been studied by Klautsch,¹ who finds: 1. Hyperemia. 2. Inflammation: (a) in the uterus, hemorrhagic interstitial endometritis; (b) in the ovaries, parenchymatous or follicular oophoritis; (c) in the tubes, fibrinous or catarrhal salpingitis. 3. Hemorrhages: (a) into the mucosa of uterus; (b) into old corpora lutea in the ovary; (c) into the subserous tissue of the tubes. 4. In the areas of extravasation the deposit of a granular ferruginous pigment derived from the blood.

The Viability of Cholera-vibrios in Feces has been studied by Abel and Claussen.² Their conclusions are: Cholera-vibrios perish in feces, as a rule, within twenty days. In some instances they are not demonstrable after from one to three days; hence the importance of a prompt examination of the dejecta. In many cases a positive result is obtained after the ordinary method has failed by pouring over 10 or 20 c.c. of feces five to ten times the quantity of peptone-water, and after twenty hours inoculating peptone-water tubes from the surface of the mixture.

In the same article the authors record observations on the important fact, to which Koch and others have also directed attention, that healthy persons may harbor the cholera-germs during epidemics of the disease. Of 17 healthy relatives of 3 cholera-patients, 13 had cholera-vibrios in their feces. In a few the germs could not be demonstrated every day; sometimes they were absent for one or two days, and then reappeared.

Reacquirement of Virulence.—Weibel³ found that cholera-vibrios the virulence of which had almost if not entirely disappeared might be rendered again pathogenic (a) by passage through a series of animals, using large doses in the beginning; (b) by combination with streptococcus or Schweinerotlauf; (c) by infection of very young animals. Inoculation into mice or pigeons, in proper quantity, is fatal, and it is possible to demonstrate a multiplication of the bacteria.

The author also found that pigeons treated with infectious cholera-cultures were immune against vibrio Metschnikowii, and is inclined to believe that the latter and the vibrio of Koch are variants of the same species.

Modification of the Germ by External Conditions.—Sirena and Sea-

¹ Münch. med. Woch., 1894, No. 45.

² Centralbl. f. Bakteriöl. u. Parasitenk., 1895, xvii. 2, 3, 4.

³ Arch. f. Hygiene, 1894, xxi. p. 22.

gliosi¹ found no noteworthy differences between the cholera-vibrios obtained from their cases at Palermo and those of Naples, Rome, and Calcutta, and conclude that the germ of cholera is a specific microorganism which may now and then become slightly modified by surrounding conditions.

Neisser's *Vibrio Berolinensis*, according to Guenther,² is a specific organism, in no wise related to the comma-bacillus of Koch.

THE GONOCOCCUS.

Biology.—Finger, Ghon, and Schlagenhauser³ have made an elaborate study of the biology of the gonococcus and of the pathologic changes produced by it in the body. Their conclusions are as follows: 1. The gonococcus is readily cultivated on Pfeiffer's serum-agar, although urine-agar gives a more luxuriant growth. 2. Stroke-culture upon urine-agar in a Petri dish is the simplest method of obtaining pure cultures. 3. In addition to the nitrogenous substances, albumin, globulin, urea, etc., salts, especially potassium and sodium sulphate, play an important role in the nourishment of the gonococcus; the presence of peptone is essential. 4. The gonococcus does not grow upon strongly alkaline media; its growth is favored by acids. 5. It grows between the temperatures of 25° C. and 39° C., but best at 36° C. 6. Gonorrheal pus contains at the room-temperature virulent gonococci as long as it is not thoroughly dried. 7. Placed in water, gonococci are soon destroyed. 8. Pure cultures die in a few minutes when brought in contact with the ordinary antiseptics. 9. The gonococcus is unquestionably the cause of gonorrheal inflammation. 10. Gonorrheal processes do not leave even a temporary immunity. 11. Injections of pure cultures into joints of animals produce a rapid, acute inflammation of the joints. There is no increase apparent in the number of gonococci. 12. The products of the gonococcus obtained by filtration of bouillon-cultures or by boiling of the cells themselves, and injected into a joint, gave rise to no changes. 13. Gonococci injected into the abdominal cavity produced an acute, localized peritonitis, without any noticeable increase in the number of gonococci. 14. Fever increases the susceptibility of man to gonorrheal infection. 15. The behavior of the gonococcus varies with the nature of the epithelium of the mucous membrane. 16. On mucous membranes covered with squamous epithelium the gonococcus remains superficial. 17. Applied to cylindric epithelium, it soon penetrates into the connective tissue. 18. When it has gained entrance into the tissues, pus-formation is rapid and active. 19. Its entrance into the blood-current gives rise to diverse articular, periarticular, and perichondritic metastases.

Cultivation of the Gonococcus.—Turro⁴ has succeeded in cultivating the gonococcus by using acid media. He had found that the gonorrheal urine, though alkaline when passed, became acid as soon as the pus had

¹ La Rif. Med., Nos. 99, 100, 1894.

² Arch. f. Hygiene, Bd. xxi. p. 96, 1894.

³ Archiv f. Dermatol. u. Syph., xxviii., Nos. 1, 2, and 3, 1894.

⁴ Centralbl. f. Bakteriöl. u. Parasitenk., xvi., No. 1.

settled, and in the acid supernatant liquid the gonococcus developed actively. Fresh, sterilized urine, with or without the addition of peptone, is an excellent culture-medium; gelatin that has not been neutralized serves especially well. Even the addition of a drop of hydrochloric acid to each 100 c.c. of the medium did not prevent growth, but merely retarded it. The growth appears as a white line, without liquefaction.

Upon plate-cultures a characteristic growth appeared in the form of white colonies, which later became elevated and hemispheric. The gonorrheal pus is antagonistic to the organisms, causing cessation of growth and involution-forms; therefore perfectly fresh pus must be used. The gonococcus grown on acid media is highly pathogenic for dogs; indeed, so great is the virulence that neither a lesion of the mucous membrane nor an actual introduction into the urethra is necessary—it suffices to touch the meatus with the cultures. The organism stains readily, but is immediately decolorized when treated with the iodine-iodid of potassium solution and alcohol. It loses its virulence when transferred to an alkaline medium; in acid media it retains its pathogenicity for more than a month.

A Bacteriologic Study of the Gonococcus.—Heiman¹ has made a careful clinic and bacteriologic study of the gonococcus (Neisser), his conclusions being: 1. The gonococcus is never present in the normal urethra, as far as experiments have shown. 2. The diplococci found in the normal urethra can positively be distinguished by the Gram stain. 3. The diplococcus described by Turro in connection with his acid-media experiments is not the gonococcus. 4. Wertheim's conclusions are endorsed, except that the author believes that liquid sterilized chest-serum is a better culture-medium than placenta-serum. 5. Urine-agar is not an ideal culture-medium. 6. Gram's stain is the only crucial staining-test for the presence of the gonococcus (Neisser), and should, therefore, be applied in all cases. 7. For the ordinary staining of the gonococcus a 2 per cent. alcoholic methyl-violet solution is recommended. 8. Certain reports of the discovery of the gonococcus in various parts of the body, such as the mouth, rectum, and serous cavities, must be looked upon with skepticism, owing to the fact that Gram's stain and culture-media were not applied. 9. The normal vulvovaginal tract is never a habitat of the gonococcus, so far as the author's experiments show. 10. Gram's stain is here also the differential stain for the diplococci found in pus-cells from the diseased vulvovaginal tract. 11. There is reason to believe that there is a specific microorganism in catarrhal colpitis, either the diplococcus of Bockhart or of E. Fränkel. 12. In specific colpitis the gonococcus found is identical with the one found in specific male urethritis. Inoculation-experiments on the human urethra confirm the belief in the specific pathologic power of the gonococcus (Neisser).

Wright² has cultivated a diplococcus from 7 cases of acute gonorrheal urethritis, from 8 cases of purulent ophthalmia, from 4 out of 20 cases of pyosalpinx, and 1 case of vaginitis in a child aged nine years. The diplo-

¹ Med. Rec., New York, June 22, 1895.

² Am. Jour. Med. Sci., Feb., 1895.

coccus was probably the gonococcus, but in the absence of injections into the human urethra positive proof is wanting. A solid serum-agar was employed for cultivation, the serum being obtained from ox-blood.

A Stain for the *Gonococcus* is recommended by Lanz.¹ The cover-glass preparation is immersed for from one-half to two minutes in a 20 per cent. solution of trichloroacetic acid, washed in water, and then stained for from three to five minutes in the following solution: Water 30 c.c., 5 per cent. solution of phenol 1 to 2 drops, saturated alcoholic solution of methylene-blue sufficient to give a deep-blue color. The specimen is washed in water, dried, and mounted in Canada balsam. The gonococci are well differentiated; the beauty of the preparation is increased by counterstaining with Bismarck-brown.

TOXINS, ANTITOXINS, AND SEROTHERAPY.

General Studies.—Roux read a very valuable paper before the Congress at Budapest,² in which he said that the antitoxins cannot be considered as derived from the toxins, because an animal can be bled to the extent of the total amount of its blood without appreciably diminishing the antitoxin; the latter must be reproduced, and, furthermore, the same quantity of toxin gives rise to different amounts of antitoxin, depending upon the mode of introduction: the smaller and the more often repeated the injections, the greater the amount of antitoxin. These facts are best explained by the theory that the toxin acts as a stimulant to the cells which then secrete the antitoxin.

To determine the manner in which antitoxins act against toxins, Roux, in conjunction with Vaillard, made the following experiments: Guinea-pigs were injected with a mixture of 900 parts tetanus-toxin and 1 part antitoxin; none developed tetanus. The same mixture was introduced into guinea-pigs immunized against vibrio Massauah; these presented distinct tetanic symptoms even when a larger quantity of antitoxin was mixed with the toxin. Tetanus also followed in animals treated with products of the bacillus coli, the water-bacillus of Kiel, and others.

The toxin is, therefore, not destroyed by the antitoxin; it was capable, even after standing several days, of producing tetanus in animals rendered susceptible artificially. This seems to prove that the antitoxin acts rather upon the body-cells than upon the toxin.

Support is given to this view by the experiments of Calmette, Phisalix, and Bertrand on snake-venom. A mixture of venom and serum of animals rendered immune against the former was perfectly inactive, but became again toxic when heated to 70° C. At this temperature the antitoxin is destroyed, while the toxin remains uninjured. The poison was certainly present in the mixture unchanged or had formed but a feeble combination with the antitoxin. These facts lead Roux to conclude that the antitoxins act indirectly by influencing the animal cells.

Roux also details some experiments made under his direction by Calmette

¹ Deutsch. med. Woch., March 1, 1894.

² Ann. de l'Inst. Pasteur, 1894, viii., No. 10.

in regard to the specificity of the antitoxins, which up to the present has been firmly assumed. The serum of a healthy horse does not prevent the action of the cobra-poison, while that of a horse immunized against tetanus renders the venom harmless. On the other hand, the serum of animals immunized to the snake-poison is powerless against tetanus-toxin.

The serum of normal rabbits has no influence on snake-venom, while that of animals immunized against rabies is strongly protective. It is therefore possible to immunize rabbits simultaneously against rabies and snake-poison; the same serum is also protective against abrin. The diphtheria-antitoxin is also capable of retarding the poisoning by abrin. The tetanus-antitoxin is of course more active against tetanus-toxin than against snake-venom, but the differences, according to Roux, are only quantitative.

Since it is unlikely that serums of such different origin have the same chemie action on the snake-venom, the author believes that they influence the cells, rendering them for a time less susceptible to the poison.

Buchner,¹ in speaking of the natural resources of the organism against disease-producing agents, states very clearly his position, with which a large number of scientists are now in accord.

The leukocytes are of the greatest importance in the defence of the organism against bacteria, but their action is not that which Metschnikoff's ingenious theory attributes to them. Instead of acting as phagocytes of living bacteria, they yield to the body-fluids the defensive proteids—the alexins—being either the direct source or the transporters of these bodies.

In view of this fact the effects of certain remedial measures can be logically explained: thus Bier's method of treating tuberculous arthritis by passive congestion acts not so much by causing stasis as by producing an increased accumulation of leukocytes at the point of infection. The same is true of celiotomy for tuberculous peritonitis, the value of which depends upon the increased supply of blood to the peritoneum which ensues, and probably upon an influence of the leukocytic accumulation. It is obvious that if the congestion is excessive, harm may result, as is demonstrated in the case of tuberculin-injections, although it is possible that the detrimental effects which sometimes follow its use are due to the fact that it is a bacterial substance and a poison. Simple innocuous methods by which we can increase the blood-supply to a part are to be preferred. Apart from constriction, position has an influence upon the distribution of the blood, and it is plausible that the continued maintenance of the horizontal decubitus, with simultaneous elevation of the lower extremities, is capable of producing an increased flow of blood to the lungs, particularly the apices, and of exercising in this way a favorable effect on incipient phthisis. This would be in keeping with the facts long ago pointed out by Rokitsansky. The application of hot and cold water, particularly the former, muscular movements, and massage can also determine an increased flow of blood to special parts.

The quality of the blood is naturally an important factor. It would be

¹ Münch. med. Woch., July 24, 1894.

possible to increase the bactericidal power if we could add to the number of leukocytes contained in the blood. There is some, but as yet meager, evidence that this can be accomplished by hot and cold baths, by muscular exercise, by the taking of food, etc. The cold-water treatment of typhoid fever and of pneumonia very probably acts so favorably not only because it abstracts heat and stimulates the peripheral nerves, but because it directly improves the quality of the blood.

Behring¹ thinks that blood-serum therapy is an antitoxic therapy, by means of which we combat microparasitic diseases, using specific antitoxins, which at the present time are only obtained from the blood of immunized animals. It is not wise to use single cases either for or against the new procedure. The specific effect of the serum appears the more rapidly, and is achieved with smaller doses, the earlier the treatment is begun. Of 100 cases which receive the single curative dose during the first forty-eight hours, not 5 will die of diphtheria. The antitoxin contained in the serum is soluble in water, and does not resist atmospheric influences; it has no effect on vegetal or animal organisms; the diphtheria-patient is the only reagent for it.

Every antitoxin is efficient only against one disease-agent. The antitoxin is produced by the action of the toxin on those albumins of the organism capable of reacting. The acute febrile and other symptoms following infection prove that the body attempts with the means at its disposal to render the poison harmless. After recovery from a spontaneous or an induced attack of an infectious disease the blood contains an excess of antitoxin, which can be used to aid other organisms in their battle against the toxin. The possibility of producing antitoxins synthetically, while not out of the range of probability, is, on account of our imperfect knowledge of the nature of the albumins, yet far removed.

Under certain conditions the diphtheria-toxin may be employed, after attenuation, to produce curative effects analogous to those obtained with tuberculin. In the acute infection in animals this mode of treatment has not been successful, but it has proved of value in the diphtheric sequelæ, particularly the nervous disturbances. The application of this mode of treatment to man would seem to be indicated only in cases of diphtheric paralysis.

Discussing the relation of bacteria, their toxins and antitoxins, Klein² states his belief that the toxins, so far as they have been investigated, are definite chemic bodies. As for the antitoxins, he rejects the view of the Munich school, that they are produced out of the toxins, and believes that the toxins stimulate the animal body to the production of antitoxins. In answer to the question, What becomes of the bacteria in the animal that has been made ill by them and then recovered? it is suggested that they may assist in the production of the antitoxins. In the majority of cases the bacteria are destroyed in the body; their substances become absorbed and incorporated into the tissues of the body, and in this way they may contribute to the

¹ Berlin. klin. Woch., Sept. 3, 1894.

² Lancet, Jan. 5, 1895.

immunity of the animal and to the production of the antitoxic property of the blood-serum.

Emmerich¹ believes that serum-therapy is the therapy of the future, but that it will only achieve its most brilliant results when the antitoxins are obtained in a pure state, so that the dosage can be accurately graduated. As regards the treatment of diphtheria with antitoxin, the prospects are not particularly good, so far as Munich is concerned, because in the majority of cases the streptococcus, and frequently a third microorganism, probably the bacillus fetidus, are present with the diphtheria-bacillus. The cause of the admixture of streptococci the author finds in the discovery of Pasquay that the canal-water of Munich constantly contains pathogenic bacteria which are indistinguishable from the diphtheria-streptococcus.

Pagano² in a preliminary communication calls attention to the fact that too little interest has been bestowed upon the bactericidal power of lymph as contrasted with that of blood-serum. In his studies on *B. typhosus*, *B. anthracis*, and spirillum of cholera he found that not only did the lymph not have a bactericidal action, but that it constituted an excellent medium for the growth of these organisms.

Flexner³ has studied the pathologic changes caused by certain so-called toxalbumins. He found that the injection into animals of certain toxic substances, such as ricin and abrin, produced, among other changes, peculiar necrotic foci in the liver. These changes were produced very acutely. To the naked eye the degenerated areas presented themselves as yellowish and yellowish-white patches. The liver-cells in these areas were still preserved in some instances, but were hyaline in appearance and devoid of nuclei. When the animal lived for a length of time the changes in the organs were somewhat different. The liver and spleen showed a large amount of iron-containing pigment, while in the kidneys atrophic patches were found. Experiments were also made with toxic agents of animal origin. The blood-serum of dogs was injected into rabbits. Doses of 1.5 per cent. of the body-weight were usually fatal. When death was delayed for a length of time, certain well-marked and interesting lesions were produced. These lesions resembled, but were not identical with, those described in connection with the toxic albumins or diphtheria, ricin, and abrin. In an animal that died on the thirteenth day chronic interstitial processes were found in the liver and kidney. In the latter the tubules were in places atrophied and surrounded by a new growth of connective tissue. In the liver the changes were practically a reproduction of cirrhosis in human beings. In rabbits that died at an early date coagulation-necrosis of the liver-cells was frequently found. The degenerative changes and the new growth of connective tissue could be studied side by side. There were necrosis and disintegration of the liver-cells, migration of leukocytes, and growth of connective tissue. The important results of the author's experiments seem to be these: That it is possible to

¹ Münch. med. Woch., p. 888, 1894.

² La Rif. Med., Sept. 7, 1894.

³ Med. News, Aug. 4, 1894.

produce experimentally not alone focal degenerative lesions, but also chronic interstitial processes analogous to those found in cirrhosis of the liver and chronic nephritis.

[The existence of degenerative foci in the liver in acute infectious diseases has been noted by Hanot and by Roger, the former having termed the condition "the infectious liver." The interstitial inflammations which the author succeeded in producing are suggestive in that they enable us to speculate on the mode of origin of many chronic inflammatory processes in man. It has been held by several writers that arteriosclerosis, as well as certain forms of cirrhosis, are infectious in nature. We have now experimental proof of such a possibility in the results both of Flexner and of Charrin (p. 1018).]

Buchner¹ injected sterile emulsions of wheat-gluten into the pleural cavities of dogs and rabbits, and obtained an abundant exudate free from bacteria, but rich in leukocytes. This exudate was more actively bactericidal than the blood or serum of the animals. To determine whether this property depended upon phagocytosis by the leukocytes or upon the action of chemic substances, Buchner froze the exudate, thereby killing the leukocytes. The thawed serum was found to be just as powerfully, if not more powerfully, germicidal than the unaltered exudate.

The Method for the Production of Diphtheria-antitoxic Serum, as practised in Roux's laboratory in Paris, is given in detail by Kinyoun.² A large flat-bottom flask with lateral tubulature (Fernbach flask) is filled with an alkaline peptone-bouillon, and after sterilization the bouillon is inoculated with a culture of the diphtheria-bacillus. The flask is placed in the thermostat for twenty-four hours for the purpose of starting the growth. It is then connected with an aspirator, by means of which moist air is made to pass through the flask. After the flask has been kept at a temperature of 37° C. for three or four weeks, the cultures are filtered into sterilized flasks and standardized. Immunity in the animal, the horse being used exclusively, is brought about by injecting the toxin in gradually increasing doses until 250 c.c. are introduced, at which point the horse will be immune against diphtheria. The serum from the blood of such a horse has antitoxic properties, 1 g. being usually sufficient to protect 50,000 g. of guinea-pig against a fatal quantity of culture of diphtheria-bacilli. The blood is taken from the jugular vein of the horse, under antiseptic precautions, to the amount of 6 to 8 liters at a time. It is then set aside in a cool place and the serum collected after twenty-four hours.

Klein³ describes a modification of Roux's method of preparing diphtheria-antitoxin, for which he claims the advantage that it produces an antitoxic serum much more quickly. The horse is injected with attenuated bacilli and their toxins; then large amounts of bacilli without the toxins from the surface of solid cultures are injected. A rise of temperature fol-

¹ Centralbl. f. Bakteriol. u. Parasitenk., vol. xvi., No. 18, p. 738, Oct. 26, 1894.

² Univ. Med. Mag., March, 1895.

³ Lancet, Dec. 15, 1894.

lows and a tumor forms at the seat of injection. When the tumor has disappeared another injection is made. In three weeks the horse will bear the injection of 2 large agar-cultures of bacilli. Antitoxic serum was obtained from one horse in twenty-three days, from another in twenty-six. From 5 to 10 c.c. of the serum proved satisfactory in the treatment of human diphtheria. In bad cases the injection was repeated.

The Protective Power of the Blood-serum of Patients convalescing from Diphtheria and of Healthy Individuals is studied by Abel.¹ His investigations attempt to answer the following questions: 1. Does the serum of patients convalescing from diphtheria possess a protective power against diphtheria-infection and diphtheria-toxin in the guinea-pig? 2. How long after the disease does this protective action develop, how long does it exist, and what is its strength? 3. Does the blood-serum of healthy individuals who never have had diphtheria possess protective power? If so, what strength does natural immunity bear to that developed after an attack of diphtheria?

The blood-serum for these experiments was obtained from the intrascapular region of adult patients by means of cups. The results in answer to the first question are—that the blood-serum of patients convalescing from diphtheria has no protective power until the sixth day; from the eighth day the majority of cases present this power; after several months the power exists either not at all or in a very slight degree.

For the purpose of solving the third question the placental blood of four women was used. It was found that the serum of all possessed protective power. We may conclude from this that the serum of the majority of individuals in the third and fourth decades possesses immunizing power against diphtheria. This is in harmony with the clinic fact that adults show a small disposition to diphtheria. It accords also with the observations of Stern, who found that the blood-serum of healthy persons contained substances capable of protecting animals against the typhoid bacillus.

The Effect of the Toxin and Antitoxin of Diphtheria on the Circulation has been carefully studied by Beck and Stapa.² The substance was injected into the jugular vein of animals. It was found that the injection of large quantities of diphtheria-antitoxin produces no marked alteration in pressure; that injections of virulent diphtheria-cultures or pure toxin exert no influence on blood-tension or pulse-rate for some hours after the injection, but that if observations are made on the day following the injection, a fall in pressure and irregularity of the heart's action are invariably noted from half an hour to an hour before death.

The circulatory phenomena are the outcome of paralysis of the heart, and are independent of any respiratory or vasomotor influence, for when the pressure began to fall neither artificial respiration nor ligation of the aorta below the diaphragm influenced the fall. The action of the toxin does not resemble that of a chemic poison, as it does not act at once, nor is its action

¹ Deutsch. med. Woch., Nov. 29, 1894.

² Wien. klin. Woch., May 2, 1895.

the result of anatomic changes, for then the disturbances in the circulation would register themselves earlier. It is more likely the result of a disturbance of the center which governs the heart-muscle. The authors suggest that when some of the centers, intracardiac or cerebral, become functionless, a sufficient number may remain to maintain the action of the heart, and paralysis does not occur until all or nearly all of the centers are affected.

The Action of Diphtheria-antitoxin on the Kidney and Heart has been studied by von Kahlden.¹ It has been claimed by several authors that the antitoxin has a deleterious effect upon these organs, particularly upon the kidneys. But in the guinea-pigs and rabbits which were injected with the serum the author found that both kidneys and heart-muscle were entirely normal, although the doses used were considerably larger than those ordinarily employed in man.

Untoward Results from the Use of the Antitoxin of Diphtheria.—F. Mendel² reports the occurrence of extensive cutaneous hemorrhages supervening five days after the use of 20 c.c. of Behring's antitoxin in a child of four and a half years.

Cnyrim³ reports 2 cases of illness following the use of diphtheria-antitoxin (Höchst). Case 1, an assistant physician in the hospital, had a mild attack of diphtheria; he received two injections of Behring's antitoxin, 10 c.c. of No. 2, and on the following day 10 c.c. of No. 3. Convalescence was slow, and left the patient very weak. Six days after the second injection an urticarial rash, with itching, appeared on the left thigh, the site of the injections. This was followed by enlargement of the glands at the angles of the lower jaw and of the inguinal glands, by fever (up to 39.5° C.), and by pain in the knees, elbows, and muscles, by headache and prostration. The pulse was rapid (112). Gradually the eruption disappeared, but there was severe pain in the upper arm on motion. Convalescence was slowly established, and the patient was incapacitated for work for a long time.

At the time the first patient became ill the other assistant physician of the hospital complained of sore throat, and injected himself with 10 c.c. of serum No. 1. On the following day the point of injection on the left thigh was very painful and rendered walking difficult. Pains in the limbs and nape of the neck and fever set in a few days later. On the fifth day the glands at the angles of the jaw were enlarged, urticarial wheals appeared, and itching was intense. Between the wheals an erythema was noted. Gradually the symptoms subsided, except severe pain and loss of power in the right arm and tenderness along the course of the median nerve and at the insertion of the deltoid muscle.

Albumin was absent from the urine of both cases. The possibility of infection is excluded; antiseptic precautions were observed; and the injections were made by different persons and with separate syringes. The author ascribes the curious phenomena to the antitoxic serum.

¹ Centralb. für Allg. Path. u. Path. Anat., Feb. 23, 1895.

² Berl. klin. Woch., Nov. 26, 1894.

³ Deutsch. med. Woch., Nov. 29, 1894.

Lublinski¹ reports a case of diphtheria in which a morbilliform exanthem developed nine days after the injection of the antitoxin. The eruption was associated with pain in the joints of the knee, elbow, and ankle, and with fever, and lasted six days. The writer considers it a form of erythema multiforme.

A similar case is described by Scholz² in which, however, fever was absent.

Asch³ reports the occurrence of a multiform exanthem in a boy fifteen days after the second of two injections of diphtheria-antitoxin. It was accompanied by fever and grave symptoms, but ended in recovery.

Koerte⁴ reports 9 cases of urticaria, and Gee⁵ a case of erythema.

Cholera-serum.—Frey⁶ treated 3 cases of cholera with serum from a convalescent cholera-patient, using it in doses of from 10 to 50 c.c. Two cases recovered.

Typhoid Immunity.—In a preliminary communication R. Pfeiffer⁷ makes the following statement regarding the specific immunity-reaction (*Immunitätsreaction*) of the typhoid-bacillus: 1. The toxin of the typhoid-bacilli exists principally in the bodies of the bacteria, and is not demonstrable in the filtrate of a recent culture-fluid. By means of heating to 54° C. or of chloroform-vapor the bacteria can be killed without injury to the toxins contained in them. The lethal dose of the poison so prepared is 3 or 4 mg. per 100 g. of guinea-pig. The toxins are very unstable. 2. In the serum of animals immunized with such a toxin antitoxins are formed which possess a specific action against the typhoid-bacillus. *Bacterium coli commune* and other bacteria allied to the typhoid-bacillus are not influenced by the serum of animals immunized to typhoid-bacillus any more than by normal serum. 3. With the aid of the specific antitoxins it is, therefore, possible to differentiate the true typhoid-bacilli from all other bacteria. 4. Similar "antibodies" are also contained in the blood of patients convalescing from typhoid fever. This affords another proof of the etiologic relation of the typhoid-bacillus to the typhoid-fever process. 5. The writer's studies have shown that it is possible to produce a strong concentration of the specific bactericidal bodies in the blood of animals. Studies on patients will show whether with the aid of such serum it is possible to produce similar bactericidal effects in the human as in the animal body, and thereby to influence the course of the disease.

Serum-treatment of Pneumonia and Typhoid Fever.—Hughes and Carter⁸ applied the serum-treatment to 14 cases of pneumonia and 3 of typhoid fever. Of 10 selected cases of pneumonia, only 5 seemed benefited by the injection of the serum. The authors ascribe the failure of action to (1) a duality of diplococci causative of pneumonia; (2) variations of the toxins.

¹ Deutsch. med. Woch., 1894, No. 45.

² Ibid.

³ Berlin. klin. Woch., 1894, No. 51, p. 1152.

⁴ Brit. Med. Jour., Epitome, 408, Nov. 24, 1894.

⁵ Ibid., p. 1197.

⁶ Deutsch. med. Woch., Oct. 25, 1894.

⁷ Ibid., Nov. 29, 1894.

⁸ Ther. Gaz., June 15, 1894.

Serum-treatment of Anthrax.—Emmerich¹ has used with success the serum of rabbits inoculated with streptococcus erysipelatosus in the treatment of experimental anthrax in animals. The serum-treatment must be continued for five days. The serum of the blood of sheep treated in the same way was even more efficient than rabbit's blood-serum. The author hopes that the treatment may be applied in cases of human anthrax.

Vaccination against Tetanus.—Tizzoni and Cattani² publish further researches concerning the vaccination of the horse against tetanus. Since it had been found by Behring that the immunizing power of the serum of the horse vaccinated against tetanus diminished by a hundredfold during the course of a year, while the immunity of the animal constantly increased, the authors determined to discover whether it would be possible to restore to the serum of a vaccinated horse, after a copious bleeding, its immunizing power by reinjecting the poison after a month or two of rest, the injection again beginning with small doses. The results have been quite satisfactory, the horses in question having furnished a serum of high immunizing power without losing their ability to react to tetanus-cultures. The authors describe in detail the effects of the injection of tetanus-cultures which it may be wise briefly to quote here: The effects are general and local. The general effects are, primarily, a high degree of excitement on the part of the animal, which is followed by a slight lassitude. During this stage of excitement, and often extending beyond it, there is an increased rapidity of the respiration, with irregularity. A frequent but not constant phenomenon is the fibrillary contraction of the superficial muscles without external stimulus, and true convulsive movements of certain muscle-groups, particularly of the hind limbs. There is also a slight trismus during the first two or three days, recurring again between the fifth and sixth days. Temperature-rise is never absent, and lasts two or three days, during which time the horses have diminished appetite.

The local symptoms consist in swelling, which radiates from the point of injection for a considerable distance. All the phenomena subside in the course of a week, except that after frequent injections there is a slight induration of the subcutaneous tissue. The authors have as yet not determined whether an equally strong serum can be obtained after the injection of the bacilli as of cultures freed from them. At present they are still using the cultures, and usually do not inject beyond 250 c.c., for they have found that the serum has the same immunizing power when this dose is reached as it had in the first series of injections; and as this strength suffices for all the requirements of practice, it is not advisable to exceed this dose, both in order to avoid alarming results and also to escape the danger pointed out by Behring—namely, that animals when they become insensible to large doses may also fail to yield serum of high immunizing power. The strength of the serum was tested at intervals of five days, small quantities of the blood being

¹ Münch. med. Woch., July 10, 1894.

² Berlin. klin. Woch., Aug. 6, 1894.

obtained by aspirating the jugular vein. In this way it was determined that the summit of the curve expressing the immunizing power was reached between the twentieth and twenty-third days after each injection, and that the moment at which a new injection should be made, or at which the blood can be withdrawn after it has reached the desired immunizing power, corresponds to this period. As the serum in the fluid state has a tendency to deteriorate in quality, to lose its power, the authors have attempted to secure it in a dry state. The precipitate obtained with absolute alcohol is not completely soluble in water, and this method was therefore rejected; also because such a large quantity of absolute alcohol was necessary as to increase the cost very materially. They have instead adopted the method of Roux and Vaillard, of simply drying the serum. In this way they have obtained a solid substance in the form of shiny, golden-yellow scales, which is completely soluble in water, even in a quantity of water corresponding to one-half of the original volume of serum. The conclusions drawn from their studies are that it is possible repeatedly to obtain from the animal vaccinated against tetanus quantities of serum possessing high immunizing power if new injections are made, and, furthermore, that it is possible to preserve the serum in the dry state for an indefinite time unaltered.

Hübener¹ studied the immunizing value of Tizzoni's tetanus-antitoxin, sold by Merck. Employing Ehrlich's method in his experiments, he found that the immunizing value was thirty millions instead of one hundred millions, as claimed by Tizzoni, and that a serum of such strength is powerless to cure cases of tetanus in man if grave or brought under treatment at a late period.

Mallein.—An interesting report on the diagnostic and therapeutic action of mallein is made by Bonome.² It was found that rabbits did not become spontaneously affected when exposed to contact with animals suffering from glanders, and that the disease produced experimentally ran a slower course in them than in other animals, but that they became exceedingly susceptible and died early when they were treated with mallein. This lessened resistance did not seem to depend upon the blood, since the glanders-bacillus does not develop in the serum of rabbits treated with mallein. It is probable that the susceptibility is due to a lessened resistance of the tissues, and in that case mallein would influence those substances which normally prevent the development of the glanders-bacillus in the cellular elements of the tissue of the rabbit. In other words, it would produce a histogenic instead of a hemogenic disposition, and would, therefore, possess diagnostic value. The injection of mallein into glandered guinea-pigs in contrast with the effect in rabbits produced no increase of symptoms. The same is true of dogs. In regard to the diagnostic value of mallein in the equine species, the author bases his conclusions on injections in 32 horses. Of these 24 reacted; 19 of these were killed, and all but 1 showed glanders; 5 were not killed. Of these 1 subsequently became glandered; the other 4 did not; 8 did not react. Of

¹ Deutsch. med. Woch., Aug. 16, 1894.

² Ibid., Nov. 6, 1894.

these, 2 were healthy; the others had suspicious symptoms that subsequently disappeared.

The conclusions are that the febrile reaction obtained with mallein is not an absolute criterion for the diagnosis of glanders in horses. An interesting case is given of glanders in man in which the diagnosis was made by the injection of mallein, and in which also marked improvement was obtained by the injections. His observations on this case lead the author to lay down the following conclusions in regard to the effects of mallein in man: 1. Mallein obtained from cultures produces in the human being suffering from glanders a severe general reaction, much more intense than that in the horse, since two to three drops of mallein are sufficient, while in the horse it requires 1 c.c. The reaction consists chiefly in an elevation of temperature, which ensues in from four to seven hours after the injection, and is accompanied by swelling of the conjunctiva and nasal mucous membrane, increased rapidity of the pulse, and augmented secretion of urine. Respiration is not influenced. 2. The degree of fever, the rapidity with which it develops, and its duration depend in the beginning upon the quantity of mallein injected. After a series of injections, however, the reaction becomes less. 3. At the point of the injection a slight painful edematous swelling is produced that soon disappears. 4. On the days immediately succeeding the elevation of temperature produced by the mallein the body-temperature sinks at times to 35.5° C., and remains at this height for twenty-four or forty-eight hours without being accompanied by subjective or objective symptoms. 5. The secretion of urine increases extraordinarily during the reaction, reaching sometimes double the normal quantity. This polyuria is also observed when the patient sweats; the urine passed during the febrile reaction is nearly always alkaline, while it is acid during the interval. Albumin and sugar are absent. 6. The injections of mallein in doses of $\frac{1}{20}$ to $\frac{1}{15}$ c.c. at intervals of two or three days produce in the course of two months a remarkable improvement in the condition of the disease.

The author also has obtained a complete cure of glanders in a horse by means of injection of mallein.

Ely¹ gives a careful resumé of the result achieved with mallein. When this substance, which was first obtained from cultures of intensified glanders-bacilli by Kalning, is injected, a typical febrile reaction is produced in animals suffering from glanders or farcy, even in the lightest form. No reaction follows in cases in which other diseases resembling glanders are present. The reaction begins in from four to eight hours after the injection, reaches its height in from ten to fourteen, and subsides between the sixteenth and twentieth or not until twenty-four or thirty-six hours have elapsed. A maximum temperature of from 39.5° – 40° C. (103.1° – 104° F.) is maintained for from six to eighteen hours, but no rise of less than 1.5° C. (2.7° F.) can be considered as ground for suspicion.

¹ Am. Jour. Med. Sci., Feb., 1895.

Hutyra and Preisz¹ have collected reports of injections performed in Germany on 473 animals, of which 203 gave a reaction. In 208 postmortem examinations were made and 199 found to be glandered; in the remaining 9, acute pulmonary tuberculosis and pneumonia, with suppuration of the peribronchial glands, would account for the fever in 4, while in none of the 9 was the reaction typic. A series of 162 injections performed at Montoise in France, owing apparently to errors in experimentation or observation, gave somewhat discordant results; for while of 143 horses in which positive effects were obtained, 142 were found diseased, 12 out of 19 giving negative or indistinct results were also glandered, and only 7 free from disease. Of 37 horses operated on by Meszaros, 8 reacted, and all were found to be diseased. Kopeczky injected 312 horses of a regiment of hussars; 27 reacted (all but 1 with a temperature of over 1.5° C. (2.7° F.)), and all were found diseased. Schindelke injected 144 horses with Forth's mallein: in 63 the temperature rose 2° – 3.6° C. (3.6° – 6.5° F.), and 62 were found to be diseased; in 63 the rise was 1.3° – 1.9° C. (2.3° – 3.4° F.), with 36 diseased and 27 healthy. In 14 the rise was only 0.7° – 2° C. (1.2° – 3.6° F.), and of these only 1 was infected. Four gave no reaction and proved to be sound.

In another series of 486 injections autopsies were made in 126 that had reacted; the results were similar to those in the other series: of 22 in which the rise was under 1.5° C. (2.7° F.), 8 were diseased; of 15 in which the rise was from 1.5° – 2° C. (2.7° – 3.6° F.), all were diseased; and out of 89 in which the rise was more than 2° C. (3.6° F.), 84 were glandered and 5 not; but the observation in 4 was open to dispute, and in 1 the reaction had not been typic.

From these results it appears evident that a reaction of 2° C. is almost positive proof of glanders; a rise exceeding 1.5° C. affords a strong presumption; while a rise of 1° C. is suspicious.

Mallein has not yet been obtained in a pure state, but is contained in varying proportions in the culture-fluids. The preparation of Forth's mallein is given as follows: The virulence of the bacilli having been intensified by their being passed through a series of guinea-pigs, cultures are made on potato between watch-glasses. When these have become perfectly black, they are put into flasks and just covered with a solution of equal parts of glycerol and distilled water, with 3 to 5 per cent. of sublimate, and kept in an incubator at 37.5° C. for from ten to fourteen days. The fluid is then filtered through a paper-filter and sterilized by an hour's exposure to the steam-current. The filtrate is dichroic—brownish-green—and retains its activity for at least six months. The dose is from 0.3 to 0.5 c.c., diluted with 5 per cent. phenol-solution to 3 c.c.

Snake-poison and Immunity.—An important contribution to the serum-treatment of disease is the study of Fraser² of Edinburgh on methods of

¹ Deutsch. Zeitsch. f. Tiermedizin u. vergleich. Pathol., Bd. xx, Heft 5 u. 6, p. 369.

² Brit. Med. Jour., June 15, 1895.

rendering animals immune against snake-venom. The author experimented with four varieties of venom: those of the Indian cobra (*Nata tripudians*), of the rattlesnake (*Crotalus horridus*) of America, of a large colubrine snake, probably a species of *Diemenia*, from South Australia, and of the ring hals-slang (*Sepedon hæmachates*) of Africa. These venoms are extremely poisonous, and also represent the chief differences in the venoms of the two great groups of the colubrine and viperine serpents.

The first step in the experiments consisted in determining the lethal doses of the poison, administered subcutaneously, for different animals. On account of the supply being abundant, cobra-venom was chiefly employed. The lethal doses were found to be as follows: For the guinea-pig, 0.00018 g. per k. of body-weight; for the rabbit, 0.000245 g.; for the white rat, 0.00025 g.; for the cat, somewhat less than 0.005 g.; for the kitten (six weeks old), 0.002 g.; and for the grass-snake, 0.03 g.

Immunity was produced by administering to the animals a succession of gradually increasing nonlethal doses, beginning with one-tenth or one-fifth, or even almost the full lethal dose. It was soon ascertained that venom exerts a double action, producing unseen functional disturbances and also visible changes. The latter are of a highly irritative character, consisting in intense congestion of the lungs, kidneys, and other organs. Changes are also caused in the blood. Irritative effects are also produced by nonlethal doses of cobra-venom, and even in a greater degree by the other venoms. In the process of immunization the local reactions are diminished, but not so rapidly as the functional disturbances.

After many failures the resistance of the animals was carried so far that rabbits could at last receive as much as from ten to fifty times the minimum lethal dose without manifesting symptoms of poisoning. Almost the only observable phenomenon was a rise in temperature.

Following the same plan of research with the other three venoms, it was found that the minimum lethal dose per kilogram for rabbits of the diamantina venom was 0.0015 g.; of the venom of *Sepedon hæmachates*, 0.0025 g.; and of the venom of *Crotalus*, 0.004 g. These venoms exceed that of the cobra in the intensity of the local reaction.

Up to the present the process of immunization against these three venoms has not advanced farther than three times the lethal dose. But it has been found that when an animal has acquired resisting power over the minimum lethal dose of one venom, it is also able successfully to resist the action of a dose above the minimum lethal dose of other venoms; but it was likewise demonstrated that animals immunized with a given venom are capable of resisting the toxic effects of that venom more effectually than the toxic effects of other venoms.

The duration of the immunity has not been definitely determined, but may be said to be quite long.

The blood-serum of immune animals is antitoxic in a high degree. In his experiments the author worked with the serum in the dry state, a condi-

tion secured without appreciable loss of antidotal power by drying the serum over sulphuric acid after it had been passed through a Chamberland filter. To this serum, whether in the dry form or in solution, the name of *antivenene* has been applied. [The word *antivenin* would be preferable.]

To test the antidotal power of this antivenene four series of experiments were undertaken. In one series the venom and the antivenene were mixed outside of the body, and the mixture immediately injected; in another series the venom and the antivenene were almost simultaneously injected into opposite sides of the body; in the third series the antivenene was injected some considerable time before the venom; in the fourth series the venom was first injected, and thirty minutes afterward the antivenene.

Only the experiments of the first and fourth series were completed. In the first it was found that an exceedingly small quantity of antivenene, as little as $\frac{1}{250}$ c.c. ($\frac{1}{15}$ minim) per kilogram, acted as an efficient antidote against the lethal dose; 0.6–0.75 c.c. against twice the lethal dose; and 1.0–1.5 c.c. against thrice the lethal dose. This is remarkable when it is remembered that this quantity of venom kills an animal in two hours. In the fourth series it was found that recovery occurred when 1.5 c.c., 1 c.c., and 0.8 c.c. per kilogram of antivenene were injected thirty minutes after a certain minimum lethal dose of venom. Nearly all the animals showed symptoms of poisoning before the antivenene was administered. In the fatal cases life was greatly prolonged by the antivenene.

It was also demonstrated that cobra-antivenene (1.5 c.c. per k.), injected thirty minutes after a dose one-twelfth larger than the minimum lethal dose of the venom of the other three species of serpents, caused the recovery of the animals.

Dr. Fraser is at present engaged in immunizing a horse against cobra-venom, and believes that antivenene will prove to be efficient in the treatment of snake-bite in man. The importance of this is evident in view of the fact that twenty thousand persons perish annually in India in consequence of the bites of serpents.

[An interesting point to which the editors would like to call attention is that the results of Dr. Fraser in a measure support the theory of the non-specificity of antitoxins. We may legitimately compare antivenene to the antitoxins, and we note that the venom of one snake is neutralized by an antivenene derived from a totally different species.]

Ewing¹ investigated the action of rattlesnake venom upon the bactericidal power of the blood-serum. Formad, in his discussion of the post-mortem findings in the animals that had died from snake-venom during the famous studies of Mitchell and Reichert, noted the speedy decomposition, and thought it impossible for the bacteria to make their way into the circulation and multiply so quickly. The results of Ewing prove very clearly that the serum of animals dead from the effects of snake-venom has lost entirely its bactericidal power.

¹ Med. Rec., N. Y., May 26, 1894.

MISCELLANEOUS.

The Calcium-salts in Pathologic Conditions.—Von Noorden and Belgardt¹ have undertaken the study of the metabolism of the calcium-salts in pathologic conditions, a subject to which but little attention has hitherto been paid. The previous investigations on this point are defective in that the quantity of lime in the food was not determined—a quantity that is very variable; it is also necessary to examine the feces as well as the urine, since in the former 90 per cent., in the latter 10 per cent., of the lime is eliminated. The first patient studied suffered from advanced arthritis deformans. It was found that every day 1.28 g. lime, .60 g. magnesia, and 1.13 g. of phosphoric acid were retained, while in the second patient, with a milder and slighter form of the disease, .75 g. of lime, .034 g. of magnesia, and 1.13 g. of phosphoric acid remained in the system. In a patient with acute articular rheumatism there was a daily loss of .42 g. of lime, .14 g. of magnesia, and .42 g. of phosphoric acid. In regard to the last case, Von Noorden coincides with Hoppe-Seyler in believing that there is an atrophy of inactivity in the bones long unused, while the retention of lime in the first two cases is to be connected with the new deposits about the joints.

The Elimination of Toxic Substances in Acute and Chronic Diseases.—Important investigations have been made by Albu,² who studied the urine, the vomit, the feces, and the sweat (one case only) of a large number of patients representing the following diseases: Graves' disease, carcinoma of the stomach, anemia, pulmonary consumption with hectic fever, Addison's disease, pernicious anemia, tetany, diabetic coma, gastric crises in tabes, acute articular rheumatism, erythema nodosum, and 1 case of autointoxication (headache, vertigo, urticaria dependent upon acute gastrointestinal catarrh), cholera Asiatica, and a generalized sepsis originating in a gangrenous carcinoma uteri, and in 1 case of so-called coma diaceticum. The author employed the Stas-Otto method and the modification of Griffith-Luff, Baumann's method, and that of Brieger, of which the first and the last are, according to him, the most reliable. It is very important in these cases to work with large quantities of the urine, at least 8 to 10 liters, and even then the author did not obtain sufficient of the substances for elementary analysis. The bodies obtained gave the usual alkaloid-reactions, especially those with phosphomolybdic and phosphotungstic acid. It is very interesting to note that in a case of tetany, the same one in which Ewald found an alkaloid in the urine, the author succeeded in obtaining by a modified Brieger's method a crystalline substance giving almost all the alkaloid-reactions and forming double salts with gold and platinum. The existence of this body in the urine makes it seem probable that tetany is the result of autointoxication from the intestinal tract. The patient died several months after leaving the hospital, and the author succeeded in obtaining an autopsy. Contrary to expectations, only slight changes were found in the intestinal tract. The

¹ Berl. klin. Woch., No. 10, 1894.

² Ibid., Nov. 26, 1894.

nervous system, both central and peripheral, as well as the muscles that had been affected by the tetanic spasms, presented nothing abnormal. In the absence of anatomic lesions, a condition noted in previous autopsies on cases of tetany, it is justifiable to regard it as the consequence of an intoxication produced by ptomaines, such as have been found in the urine by Ewald and the author. Although Albu has not made any studies of the chemie nature of the bodies found by him, he inclines to the belief that they are not specific bodies, for substances very similar have been found in a large variety of different diseases. As to their origin, it is impossible to say that they are bacterial products. In many cases, indeed, they are clearly the result of changes in metabolism—in other words, of increased destruction of albumins. Several of the bodies did not possess, at least in the quantities in which they were obtained, any toxic power when injected into mice and rabbits, although it is possible that the doses were too small. In the positive cases a centigram and less sufficed to kill white mice. If we consider these substances as analogous to the vegetable alkaloids, such as morphin, atropin, etc., we must assume that a few centigrams or decigrams when circulating in the blood are sufficient to produce the severest morbid phenomena, and even death.

[The studies of Albu, Ewald, Bouchard, and others open an important field in which studies are of as much importance as in the group of the recognized infectious diseases. Urticaria, angioneurotic edema, erythema multiforme, stercoral fever—*i. e.* the fever and general symptoms associated with prolonged constipation—and various other conditions not distinctly traceable to bacterial causes, should be investigated from the chemie standpoint.]

Fever-producing Bacterial Substances have been studied by Donath and Gara.¹ The question of the origin of fever is a very difficult one, for, on the one hand, fever is a complicated phenomenon, the chief characteristics of which are an elevated temperature and increased metabolism; on the other hand, it is produced by very various causes. Thus the transfusion of normal blood produces fever. Then there are chemie substances possessing thermogenic properties, and there is the fever of hysteria, that due to shock and other causes. We must, therefore, relinquish the idea of attributing all fevers to a common cause, and must remember that the vasomotor center which is always involved in fever responds to every stimulus in an adequate way. It is necessary in order to produce fever with the bacterial products (the filtered or sterilized culture-media) to use larger quantities than are employed ordinarily. It is also to be remembered that the normal rectal temperature of certain animals, especially of rabbits, oscillates within wide limits. The authors assumed the existence of fever only when the temperature registered for a considerable period 40° C. or above. They found that peptone bouillon-cultures of anthrax freed from their bacilli by filtration, and introduced subcutaneously or intraperitoneally, produced no fever. The soluble products of streptococcus pyogenes produced fever. The pyrogenic substance was soluble in alcohol. The metabolic products of the

¹ Wien. med. Woch., July 21, 1894.

staphylococcus pyogenes aureus were also thermogenic. Very intense fever was produced in the sheep and horse by pyocyanus-products. Experiments were also made to determine whether the enlarged spleen of acute infectious diseases contained fever-producing substances. It was found that the spleen of swine dead of Schweinerotlauf did contain the substance; also the liver of pigeons dead of the same disease. The fever in all these experiments was not protracted or severe, differing in these respects from the fever seen in acute infectious diseases. As far as the long duration in the latter is concerned, it probably depends upon the fact that the bacteria present in the body in disease continue constantly to produce the pyrogenic substance. The greater intensity of the fever may depend upon the fact that the organism is a better soil for the bacteria, which produce the thermogenic substance in a more concentrated state than in the culture-fluids; possibly also they produce yet other pyrogenic substances in the body.

Experimental Studies with the Bacillus Pyocyanus.—Charrin¹ injected filtered sterilized cultures of bacillus pyocyanus suspended in water into the ductus choledochus, the ureter, and the portal vein of rabbits, and obtained (in from two to three weeks) interstitial inflammation in the liver and kidney, while the hepatic and renal cells, as a rule, did not degenerate until later, being then in part replaced by new fibrous tissue.

[This is an observation of exceeding interest. In the experiments of Flexner, previously noted, we have seen the development of cirrhosis of the liver after the injection of blood-serum of dogs into rabbits. The primary effect was a degeneration of the liver-cells, secondarily to which the connective tissue became hyperplastic. In the studies of Charrin the sequence is the opposite—first an interstitial inflammation, then a parenchymatous degeneration.]

Thermogenic Power of Muscle-extract, etc.—Roger² found that extracts of muscle had thermogenic properties: whether these preexisted in the tissues or were formed as the result of the manipulations was not established. The total arterial blood, as a rule, induced an antithermic effect, although sometimes it displayed a thermogenic action—viz. when obtained from a sick animal or from one exposed to cold. Defibrinated blood, blood-serum, pleuritic exudate, and hydrocele-fluid induced a rise of temperature, sometimes preceded by a slight depression. Urine at first caused hypothermia, and secondarily fever; the latter effect was more marked in proportion as the subject that furnished the urine had indulged in muscular exercise.

Resistance of Embryonal Tissue to Microorganisms.—Mafucci³ has studied experimentally the question whether the embryonal tissue has the same resistance against bacteria and poisons as adult tissue; also what hap-

¹ Arch. de Physiol. norm. et path., 1893, No. 3; ref. in Centralb. f. Allg. Pathol. und Pathol. Anat., Dec. 22, 1894.

² Arch. de Physiol. norm. et path., 5 ser., t. vi., No. 2, p. 246.

³ Annals of Surgery, Oct., 1894.

pens to microorganisms that reach the tissues of the embryo through the placenta. For the first series of experiments hen's eggs were employed. His conclusions are as follows: 1. The fecundated and brooded albumin from eggs at different brood-periods offers a favorable soil for the growth of certain microorganisms, but in the living embryo the growth is not favored. 2. Microorganisms do not multiply in the tissues of the living embryo. 3. An embryo is not affected by the microorganisms in the tissues, whilst control-animals are killed. 4. After an embryo has destroyed the bacillus tuberculosis it may go on to full development, but the animal subsequently dies of marasmus, but no tuberculosis is found in its organs. 5. Dead tubercle-bacilli (avian tuberculosis) have the same effect. 6. When an embryo has destroyed a virus it does not become immune against a subsequent inoculation after it is hatched. 7. The microorganisms remaining in the albumin retain their virulence. 8. The virus of fowl-cholera becomes attenuated on the eighteenth day of the brooding period. 9. The attenuated virus remains for a few days after the birth of the chick, but disappears with its growth.

To determine the reaction of mammalian embryos Mafucci inoculated male rabbits and pregnant female rabbits. The rabbits were inoculated with tubercle-bacilli into the jugular vein, and the semen examined in from twenty-four hours to three months after the inoculation. Before the twenty-fifth day tubercle-bacilli were detected with difficulty; from that date until the end of the third month great numbers were found. Guinea-pigs inoculated with the semen became tuberculous. Some of the rabbits inoculated with tuberculosis were placed in contact with females. In some of the latter pregnancy was allowed to go on to delivery, and the young kept alive; in others the embryos were removed from the uterus and guinea-pigs inoculated with portions of their tissue. Only two animals thus inoculated became tuberculous. In the rabbits born alive tuberculous lesions were not found before two months after birth. After that the liver contained nodules having the classic structure of tubercle, but no bacilli were found in them, nor did their inoculation into guinea-pigs render the latter tuberculous. Of the mothers of these rabbits, some died of tuberculous vaginitis; others of tuberculosis of the abdominal organs without vaginitis. They became tuberculous long after delivery, but the young were separated from them as soon as they (the young) could eat.

In another set of experiments pregnant animals were inoculated with tubercle-bacilli through the jugular vein from the fifteenth to the twenty-fifth day of pregnancy. Some were killed at intervals varying from one to fifteen days and guinea-pigs inoculated with the organs of the embryos. Only three animals became tuberculous—namely, those inoculated with the organs of embryos the parents of which had been killed forty-eight hours after the injection of the bacilli. The others either died of marasmus or remained well.

The offspring born of mothers inoculated during pregnancy developed

tuberculosis, but never before the fourth month. The nodules found presented the typical features, but were devoid of bacilli, and were noninfective to guinea-pigs. They had no tendency to progress, but underwent fibrous changes.

From these experiments on mammalia the author draws the following conclusions: 1. The embryos of mothers rendered tuberculous during pregnancy can contain the bacillus after four hours from the time of inoculation. 2. Embryos obtained during the first forty-eight hours after inoculation of the mothers can render guinea-pigs tuberculous, because they contain living bacilli. 3. The majority of guinea-pigs inoculated with tissues from the embryos die of marasmus, as if they had been inoculated with dead bacilli. 4. Rabbits born of tuberculous mothers do not present tubercles until the sixth (fourth?) month after birth. At that time nodules may be found in the liver and lung, but bacilli are absent. 5. In exceptional cases the organs of embryos the father of which was tuberculous produce tuberculosis when inoculated into guinea-pigs. 6. The young of a tuberculous father present tubercles three months after birth; these tubercles do not contain bacilli.

In explanation of these facts the author submits these considerations: The virus is destroyed or attenuated by the embryonal tissue; tubercle-bacilli, for instance, are either "paralyzed" or killed, but their remaining bodies produce all the changes leading to the formation of tubercles that Prudden has shown to occur when dead bacilli are injected into animals. The greatest destruction of bacteria was observed in the liver of the fowl-embryo.

Lethal Effects of Strong Electric Currents.—Bernhardt¹ has studied the lethal and nonlethal effects produced by strong electric currents. In the body of a man aged twenty-six, who had died from the effects of a current of 1600 to 2000 volts, all the organs showed hypervenous blood; there was edema of the lungs, extravasation into the sheath of the cervical vessels, into the intercostal spaces, around the esophagus, beneath the peritoneum, and elsewhere. The muscles of the body were in extreme rigor mortis; the head was relaxed. No macroscopic changes were seen in the nervous system.

Kratter thinks that the electric shock paralyzed the heart. Experiments on animals showed that in them the respiration was usually primarily arrested, which caused asphyxia and secondary stoppage of the heart's action.

D'Arsonval reports a case in which 4500 volts passed through a man's body. Half an hour or more elapsed before efforts at resuscitation were made, but on artificial respiration being practised by Sylvester's method recovery took place.

Donnellan reports a case of the passage of a current of 1000 volts through a man, which instantly caused coma, delirium, and tonic and clonic spasms. The pulse was 80; respiration, at first stertorous, became of the Cheyne-

¹ Centralbl. f. d. med. Wissensch.; ref. Med. Rec., March 30, 1895.

Stokes type. After the injection first of morphin and then of strychnin, the patient fell into a deep sleep, from which he awoke convalescent.

A New Tape-worm.—In the intestines of hogs and cattle Cholekowsky¹ discovered a new tape-worm which he names *Tenia Brandti*. It is 3 m. long, the head is 1 mm. wide, possesses four suckers on a short, blunt rostellum, and is not armed. The genital pore is situated laterally and alternates from side to side. The uterus consists of a winding channel with lateral branches, and runs diagonally through the proglottis from right to left.

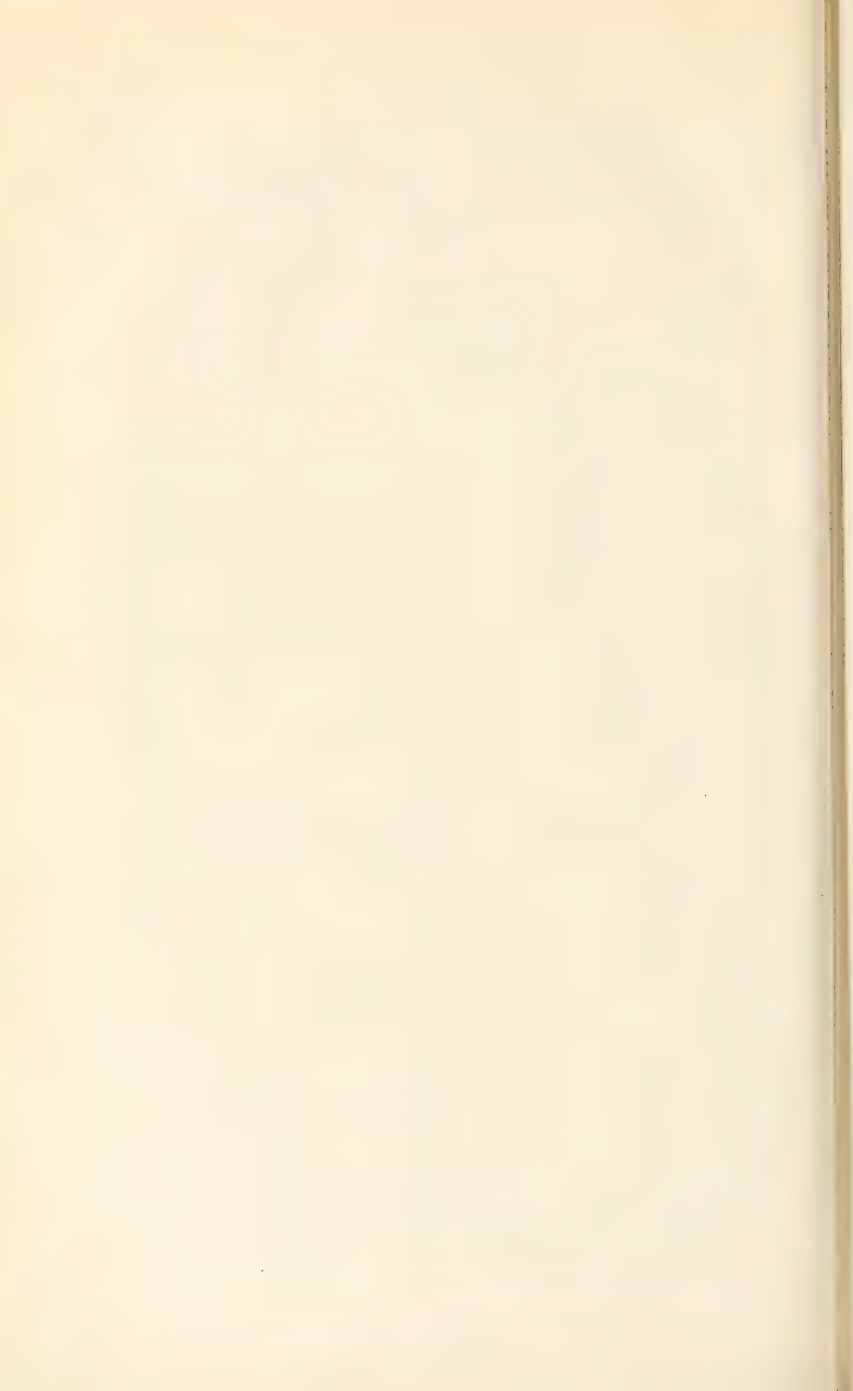
[More recently Stiles² of the Bureau of Animal Industry, Washington, has shown that *T. Brandti* is identical with a species described by Moniez, in 1879, under the name of *Thysanosoma Giardi*, and by Rivolta and by Neumann as *Tenia ovilla*.]

The Passage of Trichina through the Intestinal Wall.—It has generally been held that the embryos of the *Trichina spiralis* pass through the intestinal wall by a process of boring. Askanazy³ has carefully studied the subject. He infected rabbits, and removed the intestines in from seven to ten days, and fixed pieces in Flemming's solution and stained the sections with saffranin. His conclusions are as follows: 1. The female parasite penetrates into the villi and mucous membrane generally, not deeper, however, than the muscularis mucosæ, and lies in that membrane or in a chyle-vessel. 2. In no instance were embryos found free in the tissues of the intestinal wall or in the blood-vessels. 3. Embryos were found in the lumen of the lacteal of a villus. In one case a parasite filled with embryos projected into a lacteal which also contained embryos, indicating clearly that they had been deposited there. It is thus probable that the embryos of the trichina are deposited in the lymphatic vessels, and are in them carried to the other parts of the body.

¹ Centralbl. für Bakteriöl. und Parasitenk., Bd. xv. Heft 15.

² Ibid., Feb. 28, 1895.

³ Ibid., No. 7.



MATERIA MEDICA, EXPERIMENTAL THERAPEUTICS, AND PHARMACOLOGY.

BY HENRY A. GRIFFIN, M. D., AND V. H. NORRIE, M. D.,

OF NEW YORK.

Alcohol.—Cerna¹ draws the following conclusions from an elaborate study of the actions of alcohol: 1. Alcohol in small amounts excites and in large doses depresses both the peripheral motor and sensory nerves. 2. Excessive quantities cause a spiral degeneration of the axis-cylinder of the nerve-fibers. 3. Reflex action is at first increased and afterward diminished by an influence exercised by the drug upon the spinal cord and the nerves. 4. In small amounts the drug stimulates the cerebral functions; it afterward, especially in large quantities, depresses and finally abolishes them. 5. Alcohol causes lack of coordination by depressing both the brain and the spinal cord. 6. In toxic doses alcohol produces hyperemia of both brain and spinal cord, especially of the lumbar enlargement of the latter. 7. Small doses of alcohol produce increased rapidity of the cardiac beat; large amounts, a depression of the same. In either case the effect is brought about mainly through a direct cardiac action. 8. The drug in small quantities causes a rise of the arterial pressure by a direct action upon the heart; in large amounts it depresses the arterial pressure similarly through a cardiac influence. 9. In large doses alcohol enhances coagulation of the blood; in toxic quantities it destroys the ozonizing power of this fluid, causing a separation of the hemoglobin from the corpuscles. 10. Alcohol in small doses has little or no effect on the respiratory function; in large amounts it produces a depression of both rate and depth of the respiration through a direct action on the centers in the medulla oblongata. 11. The drug kills by failure of the respiration. 12. On the elimination of carbon dioxid alcohol exercises a varying action, sometimes increasing such elimination. 13. The action of alcohol on the amount of oxygen absorbed also varies, and may be said to be practically unknown. 14. The drug lessens the excretion of tissue-waste, both in health and disease. 15. In small amounts alcohol increases the body-temperature; in large doses it diminishes the same. The fall of bodily temperature is due mainly to an excess of heat-dissipation caused by the drug. 16. Alcohol, in sufficiently large amounts, has a decided antipyretic action. 17. In moderate amounts alcohol aids the diges-

¹ Univ. Med. Mag., Nov., 1894.

five processes. 18. Alcohol diminishes the absorption of fats. 19. The drug exercises a varying influence on the amount of urine secreted, but it probably increases the activity of the kidneys. 20. In large doses, or when continuously used for a long time, alcohol produces cirrhotic changes, of hepatic tissues especially, and paralysis of spinal origin. It also causes insanity, epilepsy, and other maladies. 21. Alcohol is mainly burnt up in the system when taken in moderate quantities, but when ingested in excessive amounts it is partly eliminated by the breath, the kidneys, and the intestines. 22. Alcohol is a conservator of tissue, a generator of vital force, and may therefore be considered as food. [The question as to whether alcohol is or is not a food has caused an unnecessary amount of discussion. If to diminish tissue-waste, to be oxidized within the body, and to increase vital energy only are necessary to constitute a substance a food, then alcohol is most certainly a food; but if conversion of the substance into body-tissue is necessary, then it is equally certain that alcohol is not a food.]

Amylene Hydrate.—Harnach and Meyer¹ conclude that amylene hydrate, like alcohol, first stimulates and then paralyzes all parts of the nervous system. In small warm-blooded animals it produces, according to the dose, a fall of temperature amounting to from 4° to 12° C. As the temperature falls the danger of death increases, but is lessened by the external application of heat. A very marked fall of temperature follows when amylene hydrate is combined with santonin. In man, dram doses may lessen the systolic elevation of the pulse-tracing and cause a disappearance of the dirotic curve. In warm-blooded animals it causes a continuous fall of blood-pressure. Respiration is at first stimulated and then paralyzed. On striated muscle it has a peculiar effect: the force of the frog's heart is at first greatly increased, but this action is soon followed by irregularity and sudden paralysis. It antagonizes the tetanizing effect of such drugs as santonin, picrotoxin, and strychnin. When administered by the mouth it lessens the elimination of urea and retards tissue-metabolism. Its hypodermic administration is frequently productive of abscess.

Ammonium Valerianate, Improved Elixir of.²—The following method of preparing the elixir of ammonium valerianate was recommended by S. C. Davis at a meeting of the American Pharmaceutical Association as being an improvement on the procedure of the National Formulary: Ammonium valerianate, 256 gr.; ammonia-water (U. S. P.), 3 fl. dr.; distilled water, 5 fl. dr.; chloroform, 6 minims; tincture vanilla, comp. tinct. cudbear, each 2 fl. dr.; aromatic elixir, to make 16 fl. oz. Dissolve the ammonium valerianate in the mixtures of the waters, and add 12 fl. ounces of aromatic elixir; then add the chloroform, tincture of vanilla, and compound tincture of cudbear, and finally enough aromatic elixir to make 1 pint.

Antipyrin.—McCall Anderson³ cites 3 cases, 1 of hysterical fits and 2

¹ Univ. Med. Mag., July, 1894, from Zeitschrift für klin. Med., Bd. 24.

² Am. Med.-Surg. Bull., Oct. 15, 1894.

³ Univ. Med. Mag., Jan. 1, 1895, from Brit. Med. Jour., Dec. 1, 1894.

of chorea, as illustrating the good effects of large doses of antipyrin. In chorea he regards it as the only medicine from which cures may confidently be anticipated. The initial dose should not exceed 10, or at the most, 15 gr.; if this amount is well borne, it should be cautiously increased to 40 or 50 gr. *t. d.* The patient must be carefully watched. The author has never observed any ill effects, at least of a serious nature, to follow these heroic doses.

[That antipyrin in large doses is a specific in chorea, or that it is superior to arsenic, is certainly not generally believed, nor is it proved by the author in this report of 2 cases. In certain cases antipyrin exerts a quieting influence in chorea, but even in this power it is decidedly inferior to chloral. To prescribe antipyrin in the large doses recommended by Dr. Anderson cannot be too strongly criticized, as its use even in relatively small doses is sometimes attended not only by distressing, but even dangerous symptoms.]

Vigneron¹ states that a solution of antipyrin, 1 in 25, has a markedly analgesic effect on the mucous membrane of the bladder, and that its use is unattended with danger. If the bladder is not distended, from $2\frac{1}{2}$ to 5 drams of this solution left in for ten minutes will diminish the pain of an instillation or of a washing to be made afterward.

Antipyrin, a Method for the Estimation of.—Shaak² makes the following reaction the basis of a method: When sodium nitrite is added to an acidified, dilute solution of antipyrin, a blue-green color is produced that is still perceptible in dilutions of 1 in 20,000. This result is due to the reaction between the liberated nitrous acid and the antipyrin, with the formation of nitroso-antipyrin. A standard solution which will not turn yellow or fade in from twelve to twenty-four hours is made by dissolving .02 g. of antipyrin in 25 c.cm. of water, adding 1.6 c.cm. of 1 per cent. sulphuric acid and 1 c.cm. of 1 per cent. solution of sodium nitrate, and then diluting to 100 c.cm. When preparing a solution of an unknown amount of antipyrin for comparison with the standard, a few trials must be made to determine the amount of the reagents required to develop fully the color, and not to be in such excess as to produce a yellowish tinge in the time required. To avoid precipitation, the solution must not be more concentrated than 1 in 500. The solution can be diluted until the color corresponds with that of the standard, and then by a simple calculation the amount of the antipyrin present can be estimated. As the reagents react with no other substances except pyrazolene compounds, that are of infrequent occurrence, and as antipyrin is readily extracted from mixtures by chloroform, this method admits of wide application. As the reaction does not take place in the presence of nitrites, but requires free nitrous acid, the incompatibility of antipyrin and (acid) sweet spirit of nitre may be prevented by neutralizing with potassium bicarbonate.

¹ Am. Jour. Med. Sci., Sept., 1894, from Ann. des Mal. des Org. Gen.-urin., No. 5, 1894.

² Therap. Gaz., Oct. 15, 1894, from Am. Jour. Pharm., July, 1894.

Apocynum Cannabium.—Petteruti and Summa¹ have experimented with the drug in the form of a decoction and of a tincture. The action of the decoction is exercised chiefly on the stomach and intestines, promoting first, catharsis and secondly, emesis. Should this action be delayed, diuresis and acceleration of the heart-beat were observed. The tincture, on the other hand, even when large doses were employed, produced marked cardio-kinetic effects without any irritation of the gastrointestinal tract. From 60 to 90 minims of a tincture having a strength of 1 in 10 were given daily. A marked effect of the tincture is the production of a diuresis that is never accompanied with albuminuria. Sphygmographic tracings show a considerable increase in the force of the pulse, the frequency of which is sometimes greatly diminished. The change in rapidity is not a constant effect. Irregularity in rhythm was sometimes noted. The tincture is likely to prove useful in valvular disease of the heart, especially in cases with edema and dyspnea. It may be given for a long time without danger and without producing irritation of the primæ viæ.

[The usefulness of apocynum cannabinum scarcely seems to have been sufficiently appreciated by the profession. Its use as a diuretic is often exceedingly valuable, and little less so are its powers in cardiac enfeeblement.]

Asaprol.—This is a calcium salt of the sulphuric ether of betanaphthol. It is a pinkish powder, odorless, and with a sweetish taste. It is soluble in water and alcohol, is antiseptic, and has little toxic property. The urine of those taking it gives a dull-blue color with iron perchlorid. Dujardin-Beaumetz² considers it a valuable substitute for sodium salicylate. He states that asaprol is well borne—(1) in doses of from 4 to 6 g., in the form of cachets, or in solution, by patients who cannot tolerate the salicylates, quinin, or antipyrin; (2) in amounts of from 3 to 5 g. by dyspeptics who not only cannot tolerate these drugs, but who are unable to retain food; (3) asaprol never produces vertigo, buzzing in the head, cephalalgia, or any cutaneous eruptions; (4) in albuminuria, accompanying acute disease, asaprol does not increase this condition or prevent its disappearance; (5) in chronic nephritis the drug is well borne and causes no gastric disturbances. It seems to be of benefit in acute rheumatism and in various forms of neuralgia. [The status of asaprol as an antirheumatic remedy can scarcely be held to be as yet established, for, while some have thought it highly efficient, others have been equally convinced of its inaction. General opinion would hardly seem to give it rank as a rival of sodium salicylate.]

Benzin-poisoning.—Ernst Rosenthal³ reports a case of poisoning in a child eighteen months old that had swallowed about a teaspoonful of benzin. Fifteen minutes later the child became unconscious. The stomach-contents, which were promptly removed, contained flakes of bloody mucus. At the end of an hour the radial pulse was scarcely perceptible, respiration was

¹ Brit. Med. Jour., Sept. 22, 1894, from Il Policlinico, Nos. 10 to 14, 1894.

² Intern. Med. Ann., 1895, from Bull. gén. de Thé., 1894.

³ Therap. Gaz., July 16, 1894, from Centralbl. f. Innere Med., No. 13, 1894.

somewhat increased in frequency and accompanied with a rasping sound. The breath smelt of benzin. For the most part the child lay in quiet narcosis, occasionally throwing itself about as if in pain. The pulse gradually improved, profuse perspiration occurred, and the child fell into a normal sleep. Six hours after the poisoning the child was still slightly stupefied. The urine was free from albumin and sugar. The next morning the child was perfectly well.

Betanaphthol.—Betanaphthol has been employed considerably in typhoid fever, but seems scarcely to have proved either generally reliable and efficient or free from injurious influences. Perhaps this is due, however, as Embley¹ claims, to the form of administration. He reports three years of experience with the drug in typhoid fever, and his observations are as follows: The first effects of betanaphthol in typhoid fever are a more or less marked diaphoresis, a gradual loss of apathy, a more natural sleep, a slower pulse, and less offensive stools. The temperature begins to fall upon about the fifth day of the treatment, and becomes normal four days later. No toxic symptoms from the use of the drug were observed. In 2 cases in which obstinate constipation existed there was a return of the fever at the end of three weeks, and the same treatment after three days' watching had to be repeated. To prevent relapses Embley recommends that the bowels be kept open, and that the treatment be maintained for a week after the temperature has become normal. The poor results hitherto recorded he attributes to the usual method of prescribing the drug in the form of a powder. The irritant action of the solid betanaphthol counteracts, he thinks, the good that results from its antiseptic properties. To overcome this he gives it in the form of an emulsion, first dissolving it by heat in 10 times its measure of olive oil or sweet-almond oil. He prescribes 4-grain doses every four hours:

R. Betanaphthol (dissolve with heat),	ʒj ;
Olive oil,	5x ;
Powdered acacia,	q. s. ;
Oil of cassia,	℥vj ;
Glycerin,	ʒj ;
Water,	ad ʒviij.—M.

Make an emulsion : dose, ʒss.

Betanaphthol Bismuth.—This is an odorless, neutral, brown powder. Experiments made in Prof. Nencki's² laboratory in St. Petersburg show that this drug when introduced into the stomach is to some extent decomposed into naphthol and bismuth, and that the decomposition is completed in the intestine. A small amount of naphthol is absorbed, and is eliminated by the kidneys, the residue, along with the bismuth, is excreted in the feces. It has been administered in daily doses of 75 gr. without the development

¹ Therap. Gaz., Oct. 15, 1894, from Australian Med. Jour., May 20, 1894.

² Arch. des Sci. biol., vol. ii.

of toxic symptoms. Engel¹ has employed it in many cases of diarrhea both in adults and in infants, and regards it as superior to the other preparations of bismuth. The dose recommended is about 15 gr. *t. d.* Others also speak highly of it as an intestinal antiseptic. [The good results obtained in chronic gastritis and in diarrhea from the simultaneous use of betanaphthol and of bismuth would make the beneficial effects of the chemically combined remedies extremely probable.]

Bismuth Loretinate.—Blum and Baerwald² report that they have found this a very serviceable remedy, because it possesses at the same time the properties of iodine and of bismuth, and is therefore both antiseptic and astringent. Applied in its natural form to ulcers, the secretions rapidly decrease, active granulation sets in, and cicatrization soon follows. In the treatment of eczema of the scalp a 10 per cent. ointment was used with success. The authors recommend it in doses of 0.5 g. once or twice daily in the treatment of the diarrhea of the tuberculous. It is well borne and is not poisonous.

Borax, the Toxic Effects of.—For the past six years Féré³ has used borax in various doses in epilepsy, and finds it far inferior to potassium bromide in efficacy, and far more dangerous in its toxic effects. Gowers noted the diarrhea, nausea, and vomiting caused even by small doses of this remedy, and accused it of causing psoriasis. In France early attention was drawn to the digestive troubles and to the eczema induced by it. The intestinal toxic effects are the most frequent and the earliest. Occasionally absolute intolerance exists, nausea and vomiting occurring even after the first dose. More often, after a few doses, there are loss of appetite, sensations of weight and heat at the epigastrium, with ensuing nausea, pains in the temples, and vomiting. Administration in glycerol, instead of in aqueous solution, or the use of intestinal antiseptics may remove these effects. Borax causes a peculiar dryness of the skin and mucous membranes. The lips and tongue are denuded of epithelium. The lips and angles of the mouth are fissured, and the conjunctivæ injected. The lack of fatty matter in the skin is shown by Arnozan's method. Finely powdered camphor is placed on water, into which is plunged a glass rod previously held in contact with the skin. The camphor particles cease to gyrate if fat is present. No such reaction occurs in "borism." The skin loses its fat in a determined order, naturally sebaceous parts, as the face, the alæ of the nose, being last affected by the borax. Conversely, the fat reappears first in these parts on stopping the administration of the drug. The dryness of the skin, even without an eruption, often coincides with a dryness of the hair, which falls out. Sometimes even the beard, eyebrows, axillæ, and pubes are stripped. Constitutional skin-rashes may be rekindled by borax, but more special to it are the following: 1. An eczema, like seborrhœic eczema, but presenting several varieties: (a) Papules or small

¹ N. Y. Med. Jour., March 30, 1895.

² Am. Med.-Surg. Bull., Nov. 15, 1894, from Münch. med. Woch., Sept. 4, 1894.

³ Brit. Med. Jour., Jan. 5, 1895, from Sem. méd., Nov. 3, 1894.

circles, with red and squamous border, which enlarging fuse together, forming more or less extended, often symmetrical plaques. This variety begins in the least sebaceous parts, the hypogastrium, and lateral regions of the trunk, etc. (b) An eruption of seborrhoeic acne, with slight desquamation of the scalp, with or without alopecia. These forms usually improve under intestinal antiseptics or local treatment without ceasing the administration of the drug. (c) Pink or red, more or less confluent plaques, giving the skin a uniform tint, with fine desquamation, deserving the epithet scarlatiniform. 2. Papular eruptions of variable extent, confluent or not, with pruritus, and followed sometimes by fine branny, sometimes by large flaky, desquamation. Sometimes with the papules are petechiae. Cachexia, emaciation, edema of the face and extremities are often present with these generalized eruptions. There may be cachexia without cutaneous lesions, and the nails may be deeply furrowed transversely, as after fevers. Furunculosis may occur. A line on the gums resembling the lead-line is probably of microbic origin. In two patients large painful, symmetrical "myosites" of the sternomastoid muscles were present, with a slight rise of temperature; this condition lasted from fifteen to twenty days. Lastly, localized swelling of the eyelids, face, or extremities may occur without other symptoms. In these cases the urine will be found to be loaded with albumin. The cessation of the drug, probably owing to its tardy elimination, does not always arrest the kidney trouble. The author reports 1 case in which the kidney complication proved fatal. [Though undeniably effective in some cases, the use of borax in the treatment of epilepsy is in general not comparable in good effect to that of the bromids, and the danger of "borism," as pointed out by Féré, makes its employment in this disease generally undesirable. If employed it should be only under most careful supervision.]

Cactus Grandiflorus.—In summarizing an elaborate essay on this drug Gordon Sharp¹ finds as follows: The literature of *cactus grandiflorus* is comparatively extensive, but vague, too many properties being ascribed to the drug and upon too slender evidence, there being no authoritative evidence of a pharmacologic or of a carefully carried out therapeutic kind. The chemistry is as yet unknown, authorities on this subject not even mentioning the presence of a glucosid or alkaloid, and, so far as he can make out after extensive trials, he has been unable to obtain either of those bodies. The most important agents he finds to be a series of resins. The pharmacology is necessarily indefinite, one having to work with rather insoluble resins. These contract the blood-vessels of a frog, but this is not of the nature of a digitalis-contraction, but depends, he believes, on simple acidity. On the heart of the frog the resins have little or no effect, comparisons being made with digitalis in the same animals. The drug itself would appear to be pharmacologically inert, and there is no proof that it shortens diastole, or that it has any special action on the heart-muscle at all. The therapeutics of the subject, he thinks, is clear enough. *Cactus grandiflorus* cannot be

¹ Practitioner, Sept., 1894.

included in the list of cardiac drugs. It is not even a simple stomachic tonic, and, at most, all one can say is that it has some small diuretic action. [The use of cactus in functional disturbances of the heart has been frequent, but, though seemingly efficient in the relief of palpitation and similar conditions at times, the drug is scarcely entitled to more credit than the author has given to it.]

Cadmium Salicylate.—This salt may be prepared, according to Cesaris,¹ by the action of salicylic acid upon cadmium hydroxid or upon cadmium carbonate, or by the interaction of barium salicylate and cadmium sulphate. The salt is best prepared by one of the two first-named procedures. Chemically pure cadmium salicylate occurs as white, shining crystals of a sweetish-astringent taste. The melting-point is above 300° C. The salt dissolves in 24 parts of boiling water, in 68 parts at 23° C., and in 90 parts at 0° C. It is soluble in alcohol and ether, more so in hot than in cold; it is very soluble in hot glycerol, without precipitating after cooling; it is insoluble in chloroform and benzin. It slightly reddens litmus-paper, and dissolves in sulphuric acid without producing any reaction. In cold nitric acid it dissolves without change, and in hot with the evolution of reddish vapors. Hydrochloric acid yields a white and copious precipitate of hydrated calcium chlorid. Ferric chlorid colors it violet. Cadmium salicylate has the formula $(C_6H_4OHCOO)_2Cd$, and contains 29 per cent. of metallic cadmium. It is said to possess a more energetic antiseptic action than the other cadmium salts, and to give good results as an astringent antiseptic in the treatment of purulent ophthalmia, the vascular engorgement of conjunctivitis, and thickening of the cornea.

Calcium Chlorid.—Saundby² reports a case of severe bleeding from the rectum, probably due to piles, in which calcium chlorid administered in small doses every four hours caused the bleeding to stop in five days. Other remedies had completely failed. In a case of purpura hæmorrhagica, where there was bleeding from the gums and slight hematuria in which the usual hemostatics proved useless, small doses of the chlorid checked the bleeding in a few days. The size of the dose is important, as Prof. Wright has demonstrated that the coagulability of the blood is diminished instead of increased if a large dose is given. The author used a solution of a strength of 1 to 5, and never prescribed more than 30 minims, or 6 gr., though in the case of purpura this quantity was given every two hours during the day for some days. [Though the hemostatic power of calcium chlorid may be more than we supposed, this action seems scarcely a reliable one, and coincidence cannot be excluded from testimony furnished by but 2 cases.]

Cannabindon.—Kobert³ has given this name to a substance possessing some similarity with cannabis indica. It is described as a syrupy body

¹ Jour. de Méd. de Paris, Nov. 11, 1894, from Rép. pharmacie, Sept. 1894.

² Intern. Med. Annual, 1895.

³ Am. Med.-Surg. Bull., July, 1894, from Chem. Ztg., No. 18, 1894.

of a beautiful dark cherry-red color, soluble in alcohol, ether, and chloroform. Its therapeutic action was tested in man and in cats. A dose of 2 cgm. is reported to produce an intoxicating effect on susceptible individuals; with refractory individuals the dose must be increased to 8 cgm. to produce a similar effect. It does not provoke sleep, but causes a state of intoxication, with hallucinations, not always of a pleasant nature. The drug becomes, when repeated, a means of sensual enjoyment like tobacco. Therapeutic data are wanting.

Cannabis Indica.—Mackenzie¹ speaks highly of cannabis indica in all forms of cephalalgia. In the headache attending cerebral growths and in that of chronic uremia it is serviceable. He has found it to be almost a specific for the continuous form of headache that begins in the morning and lasts all day. The pain is generally dull and diffuse, and may persist for weeks or even years. The author begins usually with from $\frac{1}{12}$ to $\frac{1}{2}$ gr. of the extract night and morning. In obstinate cases he increases the dose (always giving a stronger dose in the evening) until a marked relief is obtained or the symptoms of poisoning appear. He sometimes combines it with cinchona, gentian, or caffein hydrobromate. In various neuralgic affections, gastralgia, enteralgia, the pains of tabes, the drug often proves useful. In skin-diseases associated with much itching, especially in senile pruritus, it is often used with great benefit. To avoid any untoward effects from its use, it is advised always to begin with small doses and to increase them gradually. [The opinion of Mackenzie serves to emphasize a use of cannabis indica which has long been practised and highly esteemed.]

Carpain.—This is the active principle obtained from the leaves of the *Carica papaya*. In its action it closely resembles digitalis. In doses of $\frac{3}{8}$ gr. daily von Oefele² states that it causes the same disturbances in the cardiac rhythm. He found it most useful in aortic insufficiency and stenosis. In doses of $\frac{1}{10}$ gr. daily it lessened the frequency of the pulse, relieved the dyspnea, and doubled the excretion of the urine. It is best given hypodermically; given by the mouth it is said not to be so effective.

Camphorated Phenol.—The combination of camphor with phenol moderates the caustic and disorganizing action of the acid, but does not interfere with its antiseptic properties. It is prepared by mixing 1 part of phenol with 2 parts of camphor, allowing the mixture to stand for some hours, and purifying it by washing with water. The liquid formed is of a reddish-yellow color and is insoluble in water, but soluble in ether and in alcohol. Toms³ states that he has used the preparation diluted with 50 per cent. of cotton-seed oil with excellent results as a dressing for a severe case of ulcerating epithelioma of the leg. This combination is said to be one of the best remedies for pruritus.

Oil of Cinnamon, Antiseptic Properties of.—Kyle⁴ has used the

¹ Univ. Med. Mag., Dec., 1894, from Sem. méd., No. 14, 1894.

² Intern. Med. Annual, 1895.

³ Ibid., from Med. Record.

⁴ Am. Jour. Med. Sci., July, 1894, from Therap. Gaz., No. 4, 1894.

Ceylon oil in the treatment of infective varieties of nasal, laryngeal, and aural affections with marked success. He explains its action as follows: The germ, being enclosed in a capsule of varying thickness, composed of cellulose, when brought into contact with the active principle of the oil, has its cell-wall contracted. This practically deprives the germ of its nutrition. Wounds treated with a solution of the oil 1 in 500 healed by first intention. It is not a safe antiseptic for surgical purposes, but is a good mucous-membrane antiseptic.

Chloral Hydrate.—Holstein¹ of Paris finds chloral to be an excellent remedy in the chronic constipation of certain neuropathic patients. He prescribes about 1.5 g. at bedtime. The laxative effect is often maintained for several days. For obvious reasons it should not be so employed for any length of time. Owing to its property of relaxing spasmodically contracted unstriated muscles, von Robitansky uses it in combination with potassium iodid in the treatment of asthma. For like reasons Cherevsky employs the same combination as a vasodilator—0.15 to 0.20 g. is given several times a day. [The power of chloral hydrate to cause vasodilatation cannot be too highly esteemed. In this use it is singularly to be relied upon and is far more potent than is nitroglycerin.]

Chloralose ($C_8H_{11}ClO_6$) is formed by heating a mixture of glucose and anhydrous chloral. It occurs in white crystals, feebly soluble in cold water, but easily soluble in hot water. Its taste is acrid. From a careful study of the actions of the drug in health and in numerous cases of insomnia De Montyel² draws the following conclusions: Its most pronounced action is on the central nervous system, on which it exerts either an intense depression manifested by sleep and sedation, or a slight and passing excitability occasionally amounting to delirium. The sleep comes on rapidly, is quite profound, though easily disturbed. The narcosis is followed by a feeling of well-being. Chloralose has the peculiar property of causing a psychic blindness. It is capable of producing dilatation of the pupil, a diminution of visual acuteness and diplopia. Upon sensation the action of the drug is very feeble. Reflexes are generally somewhat exaggerated. On the muscular system the effect is twofold: one, characterized by slight muscular relaxation, consisting of a sense of weakness of the lower extremities; the other, by muscular irritability, often quite marked, and manifested by tremors, contractions of groups of muscles, or by general convulsions. The double exciting and sedative actions upon the brain and the spinal cord are always developed in both organs in an opposing manner: the sedative action on the brain is associated with muscular excitability, whereas the exciting action corresponds with the muscular relaxation. Chloralose is capable of steadying a very irregular pulse, the diminution of the number of heart-beats, persisting even after awakening from the sleep caused by the

¹ Am. Med.-Surg. Bul., Nov. 15, 1894, from *Sem. méd.*, p. 434, 1894.

² *Therap. Gaz.*, Jan. 15, 1895, from *Bull. génér. de Thérapeutique*, July 30; Aug. 15, 30; Sept. 15, 1894.

drug. It increases the appetite and rarely produces gastric disturbances. The system soon becomes accustomed to the therapeutic action of the drug as a sedative and hypnotic, but with the lessening of the sedative action there is a decided increase in its exciting action. The action of chloralose is variable. By some individuals large doses are well borne, whereas in others even small doses produce marked muscular symptoms and even cause wakefulness. The sedative and hypnotic effects are more prompt to manifest themselves than those characterized by muscular excitability. Flemming¹ states that chloralose causes sleep to occur in from twenty to sixty minutes. The sleep is calm, refreshing, and lasts from four to ten hours. On awakening there is no unpleasant sensation. The temperature is lowered a fraction of a degree; there is no alteration of the blood-pressure. The dose is from 2 to 6 gr. in milk or cachets. After larger doses slight tremor and vertigo have been observed. Flemming, after a large clinical experience with the drug extending over eleven months, concludes that chloralose is of benefit in all forms of functional sleeplessness, in the insomnia of psychic excitement, of hysteria, of neurasthenia, and overwork, of functional cardiac irritability and in attacks of epilepsy and somnambulism. It is useless in the insomnia of alcoholic excitement or in that due to any painful organic lesion or peripheral irritation. Chambord² considers chloralose of especial value as a hypnotic in heart-disease. Sagaze³ observed in using chloralose as a hypnotic in tuberculous patients that the night-sweats disappeared with the insomnia, and that this condition persisted so long as the remedy was used. He gives 0.05 at bed-time, and if necessary repeats the dose every half hour for four doses. If this is not enough to produce sleep the dose is doubled. Apparently the only drawback to the use of the drug is that it may give rise to convulsive complications, which, though not grave, are occasionally alarming. They generally happen during the sleep.

Chloramid.—In an excellent paper on the treatment of the night-sweats of pulmonary tuberculosis, Conkling⁴ states that he has found in chloramid a very valuable remedy. It produced sleep, checked cough, stopped sweating, and had no disadvantages. It was given in one dose of from 30 to 35 gr. at bed-time, either in powder or as Schering's elixir. It succeeded in over one-half the administrations, diminished sweating in less than one-fourth, and failed in less than one-fourth. In some cases even the first administration was successful. [If we can add to the well-known hypnotic effect of chloramid an anhydrotic action, we shall possess a valuable therapeutic combination, but time has as yet not served to establish the power of the drug over night-sweating.]

Chlorobrom.—This is a mixture containing 30 grains each of chloralamid and potassium bromid in an ounce of water. The dose is 1 ounce. Wade

¹ British Med. Jour., Sept. 1, 1894, from Pract., July, 1894.

² Ibid., July 7, 1894, from Rev. de Méd., June, 1894.

³ Am. Med.-Surg. Bull., Oct. 15, 1894, from Sem. méd., 1894, p. 410.

⁴ The Year-book of Treatment, 1895, from Therap. Gaz., Sept., 1894.

and Keay¹ both recommend it as a safe and reliable hypnotic. They state that its action is most favorable in melancholia, especially of the milder type, and that in acute mania it is fully as reliable and lasting in its effects as any other hypnotic. [The use of chlorobrom as an hypnotic is often desirable, but its reliability, especially in the severer forms of insomnia, is not great.]

Chloroform.—Schmidt² recommends the use of chloroform prepared by Anschütz from salicylid chloroform. Salicylid is an anhydrid of salicylic acid, and forms with chloroform a crystalline body. By heating this body a pure chloroform distils over. The author considers it the best chloroform prepared. Pileher³ of Brooklyn contributes an article on this subject. The odor is less pungent than that of ordinary chloroform. In anesthetizing, the stage of excitement is less marked; the narcotic effect is obtained much less rapidly; and it is necessary to watch the patient carefully during its administration to see that he does not come out from its influence. Complete anesthesia occurs in about ten minutes. The author states that in his experience the heart's action is not accelerated or weakened by this form of chloroform, but that, on the contrary, he has observed a decided improvement in its character. Consciousness is recovered much sooner after the use of Anschütz's chloroform. The after-effects of chloroform-narcosis—nausea, vomiting, anorexia—are generally absent. It is best administered by the drop method. About 1 c.cm. is required for each three minutes of complete narcosis.

Copper Arsenite.—Hedlicka⁴ describes a number of cases of acute and subacute inflammations of mucous membranes attended with pain, suffusion, and more or less watery discharge, in which he used arsenite of copper with almost universal success. He finds that it is most efficient in solutions of from 1:50,000 or 100,000. These solutions are easily made by dissolving one $\frac{1}{100}$ -grain pellet in 1 or 2 ounces of water, and are applied at frequent intervals, seldom longer than an hour (in the case of the bladder, urethra, and nose), and often not longer than from ten to fifteen minutes (in the case of the eye.) The remedy has little action in cases in which the discharge is thick and persistent unless the affected surface is thoroughly cleansed by irrigation or lavage before the solution is applied. The duration of the treatment ranged from a few hours to two or three days in mild cases to three or four months in severe cases. The author claims that relief is almost always instantaneous, and that no other remedies were needed.

Creosote.—Weiss⁵ maintains that creosote does not exercise a direct influence upon tuberculous processes in the lung. In most cases under treatment, whether the tubercular infiltration is slight or extensive, improvement of appetite, lessening of cough, and increase of weight are observed. Weiss concludes that creosote is not a direct specific against tuberculosis, but

¹ N. Y. Med. Jour., May 4, 1895, from Am. Jour. of Insan., April, 1895.

² Münch. med. Woch., June 26, 1894.

³ N. Y. Med. Jour., June 23, 1894.

⁴ Ibid., Sept. 29, 1894.

⁵ The Year-book of Treatment, 1895, from Centralbl. f. die gesammte Therap., March, 1894.

that it influences the disease indirectly by lessening secretion and acting as a stomachic. It does not, even when given in large doses, appear to influence hemoptysis. He regards creosote as the best remedy for the symptomatic treatment of pulmonary tuberculosis. [The conclusions of Weiss are now those of the profession in general, but, though its action as a stomachic may occur, it must not be forgotten that in large or long-continued doses creosote is potent to cause great gastric disturbance, and this in a disease in which preservation of nutrition and digestion is all-important.]

Digitalis.—According to Pech,¹ the effect of digitalis when taken in doses of 10 cgm. for one or several days is not manifested until the fourth or fifth day. If 20 cgm. be taken, its action will be perceived on the third day. In doses of 50 cgm. digitalis acts within twelve hours. The effect of a single dose is said to continue for five days. If the medication is continued for five days, the effects persist for from eighteen to twenty days.

Digitoxin.—Masius² of Belgium has employed digitoxin for more than a year in the treatment of cardiac diseases, pneumonia, and typhoid fever. He prescribes it in doses of $\frac{1}{64}$ of a grain thrice daily. Its action is prompt and decided: it rarely causes any gastric disturbance. Within from twelve to twenty-four hours there is a marked improvement in the pulse, and diuresis is induced. The daily quantity of urine sometimes reaches four quarts. The effect of the remedy persists for from eight to ten days. In pneumonia and typhoid fever the drug is said to exert a favorable influence on the temperature and circulation.

Disinfectants.—The relative value of disinfectants is a subject that has been so much discussed that anything conclusive must be gratefully received. Lenti³ summarizes the results of a series of researches as follows: 1. Alcohol in the absence of water neutralizes all bactericidal power on the part of mercuric chlorid or phenol with regard to anthrax spores. The bactericidal action is not exercised until the dilution of the alcohol with water is greater than 2 per cent. in the case of 1:1000 sublimate solution, or than 70 per cent. in the case of phenol. 2. Glycerol interferes with the action of a 2:1000 solution of mercuric chlorid if the proportion of water be less than 40 per cent. In the case of phenol it is still more manifest. 3. Phenol and lysol dissolved in olive oil have no disinfecting action.

Diuretin.—It seems that diuretin still has its admirers, for Pawinski⁴ concludes from his observations that the action of diuretin on the heart is an indirect one—that owing to the amount of fluid removed from the body through its diuretic action the work of the heart is economized. The

¹ Am. Med.-Surg. Bull., Oct. 15, 1894, from Gaz. méd. de Strassb., 1894, No. 6.

² Univ. Med. Mag., Jan., 1895, from Bull. de l'Académie royale de Médecine de Belgique, No. 6, 1894.

³ N. Am. Pract., Chicago, June, 1894, from Ann. dell' Istituto d'Igiene sperim. della R. Università di Roma, vol. iii. fasc. iv.

⁴ Univ. Med. Mag., Sept. 9, 1894, from Zeitschr. für kl. Med., vol. xiv. parts 3 and 4.

diuresis produced is often excessive, from 10 to 12 quarts being passed in some cases in twenty-four hours. The maximum is reached on the fourth day. The substance is indicated in heart-disease when digitalis has failed or is badly borne. Better results are obtained when there is disease of the heart-muscle than in valvular disease. In kidney-disease it is of less value, but is often very serviceable in high grades of interstitial nephritis with increased arterial tension. The dose is 90 gr. in twenty-four hours in solution.

Djambœ.—The leaves and bark of this plant have been used by Hugel¹ in several hundred cases of gastro-enteritis in children with good results. In 5 cases in adults, accompanied with vomiting, diarrhea, low temperature and cramps, a few doses of calomel, followed by djambœ, produced prompt improvement. In 25 cases of diarrhea in pulmonary tuberculosis it gave good results; in 4 similar cases it was without effect. For children this author recommends an infusion; for adults, a fluid extract.

Duboisin.—De Montyel,² chief physician of the Asylum for the Insane, Department of the Seine, notes the following effects of this drug when administered to produce sedative effects: *Skin.*—The skin becomes dry, but the dryness is not accompanied by any symptoms that attract the attention of the patient. Sometimes perspiration is produced. *Mouth.*—Dryness of the mucous membrane occurs, which causes discomfort. Occasionally intense salivation is produced instead of dryness. *Urine.*—Usually there is a marked diminution in the quantity. *Bladder and urethra.*—No effect is usually observed. One patient had urethral spasm. (He was suffering from general paresis.) *Stomach.*—Digestive disorders usually appeared after the drug had been used for a few days. There is loss of appetite; the tongue is sometimes coated, and sometimes not. The taste in the mouth is like that of soap. There is vomiting, which usually occurs at or after the principal meals. Vomiting was not observed when the drug was only administered at night, except in two cases. *Nutrition.*—General loss of flesh in all patients to whom it was administered, rendered it necessary in many cases to abandon the drug. The emaciation was observed in patients who did not suffer from vomiting or loss of appetite. Loss of weight was not observed in patients to whom the drug was given only at night. *Nervous System.*—A decided sedative effect on the nervous system was observed. This was accompanied by reduced arterial tension, elevated temperature, and sluggish pupils. Flushing of the face and vertigo were occasionally noted. Patients soon obtained a tolerance to the sedative effects of the drug. Thus the only effect of the drug from which the patient obtains a temporary advantage is lost after from four to twelve days. De Montyel says in regard to its administration: Hypodermic injection is superior to its administration by the mouth, both as regards the rapidity of its action and its efficacy. It is also better to give the drug interruptedly than continuously,

¹ India Med. Annual, 1895, from Münch. med. Woch., July 17, 1894.

² Intern. Med. Annual, 1895. See Bull. général de Thérapeutique, 1894, p. 145.

in order to avoid a tolerance of it; and further it is better to give it in divided doses than in a single dose.

Dulcin.—Dulcin, an aromatic urea-derivative—paraphenetol carbamid—is a white powder soluble in 800 parts of water at 15° C., in 50 parts of hot water, and in 25 parts of 97 per cent. alcohol. It has a pure sweet taste, and is over 200 times as sweet as saccharin. Kobert¹ of Dorpat concludes that dulcin, in the relatively small doses necessary to sweeten the food of a diabetic patient, is, so far as is at present known, harmless. He mentions a case in which 8 g. were taken daily with impunity for three weeks. Ewald uses it in amounts up to 1.6 g. daily. Experimentally, dulcin seems to have no special effect on rabbits; in dogs it produces hæmatogenous icterus which may prove fatal. In cats there is no alteration in the blood, but death follows the development of cerebral symptoms.

Emol.—This name is given by Jamieson² to a natural product found near Dunning, Perthshire. When purified it is a delicate, soft, impalpable powder of a pink color. Chemically it contains principally steatite, silica, alumina, and a mere trace of lime. It is probably to the first ingredient named that its peculiar properties are due. A small amount mixed with hard water immediately renders it soft. Used in this way with warm water, it acts as a natural soap. Men engaged in its preparation found that their previously horny palms became so softened by continued contact with it that they were no longer fit for active manual work. This experience led Jamieson to try it for softening and removing horny accretions encountered in some states of keratosis of the palms and soles. When a paste of emol was made by moistening some with water, and applied rather thickly, evaporation being prevented by covering it with gutta-percha tissue, the epidermic masses became softened and loosened and could be peeled off in layers, leaving the part so treated soft and smooth. He reports that in this way he was able to remove the hard horny epidermis in several cases of eczema of the palm and sole.

Ergot.—Ergot has long been used in the treatment of headache accompanied with vascular engorgement, and its value receives additional confirmation from Thomson,³ who recommends large doses in migraine. He gives 1 dram of the fluid extract with an equal quantity of elixir of cinchona in water as soon as the premonitory symptoms of the headache are noticed. The patient is at the same time advised to lie down and keep quiet. The dose is repeated hourly for three doses, if necessary. If the drug is vomited, it may be given by the rectum. It often relieves neuralgias when everything else has failed.

Ethyl Bromid.—This is regarded as a useful anesthetic for short operations. Cumston⁴ stated that the drug is fit for administration only

¹ Univ. Med. Mag., Aug., 1894, Centralbl. f. innere Med., April 21, 1894.

² Intern. Med. Annual, 1895; Brit. Med. Jour.

³ Med. Record, Mar. 17, 1894.

⁴ Boston Med. and Surg. Jour., Dec. 20, 1894; see also N. Y. Med. Jour., May 26, 1894; Centralbl. f. Chir., No. 2, 1894.

when extremely volatile, colorless, and of a sweet odor. It is slightly inflammable. As it is decomposed on exposure to air, light, or dampness, it must be kept in yellow bottles carefully corked. The dose for a child is 3 drams; that for an adult, 6 drams. The whole quantity should be used at once, and the mask should be held close to the mouth and nose, so that no air may enter. Sleep comes on in from twenty to thirty seconds, and lasts two or three minutes. When narcosis is complete the mask should be removed and under no consideration reapplied. The return to consciousness is prompt and usually unattended with vomiting or headache. Cumston has used it in 200 cases. Although cases of sudden death under its use have been reported, he considers it perfectly safe if properly administered. The contraindications are dangerous lesions of the heart, lungs, or kidneys. Ethyl bromid must not be confounded with ethylene bromid, a substance possessing very dangerous properties. When prolonged narcosis is desired, anesthesia may first be induced by ethyl bromid and continued by chloroform. This procedure is said to shorten the excitement of the initial stage of chloroform-narcosis.

Europphen.—This is a fine, yellow, very light powder, soluble in alcohol, ether, chloroform, and oils, but insoluble in water. It is the result of the action of iodine on isobutylorthoecresol in the presence of an alkali. Europphen parts with its iodine slowly. This renders it less likely than iodoform to produce toxic symptoms, but unfortunately, markedly lessens its remedial power.¹ Oefelein and Neuberger² have used it locally in 200 cases. They find that all kinds of wounds heal quickly under it. It possesses great drying power, is not irritating, and is devoid of smell.

Ferratin.—This name is given by Schmiedeberg³ to a substance resulting from the action of egg-albumin on an iron salt in the presence of heat and of an alkali. Two forms of ferratin are known to commerce—the one simple and insoluble in water; the other is a sodium compound easily soluble. Mafori⁴ finds that it contains from 7 to 8 per cent. of iron, and that it is freely absorbed from the intestines. Injected into the blood, it appears in the urine and feces only in minute quantities. A substance closely resembling ferratin is found in the liver of many animals in considerable quantities. As it appears to be identical with hematogen, a substance separated from egg by Bunge and shown by him to aid in the formation of hemoglobin, it should prove a valuable blood-maker. It causes no derangement whatsoever of the stomach or intestines, even after prolonged use. The dose varies from 15 to 30 gr. daily. Acids should be avoided. Germain-Sée⁵ regards ferratin as of great value in those suffering from hard work and in chlorosis. It has been used with excellent results in Von Jaksch's⁶ clinic.

¹ Hare: Practical Therapeutics, 1894.

² Univ. Med. Mag., Sept., 1894, from Monatsheft für praktische Dermatologie, 1893.

³ Centrabl. f. klin. Med., No. 45, 1893.

⁴ Univ. Med. Mag., Aug. 1, 1894.

⁵ Therap. Gaz., Dec. 15, 1894, from Presse méd., Aug. 25, 1894.

⁶ Prag. med. Woch., April 18, 1894.

Ferropyrin.—Ferropyrin, recommended by Hedderich¹ as a hemostatic, is a double salt of the chlorid of iron and antipyrin. It is a reddish powder, soluble in water, and possesses the hemostatic properties of the chlorid of iron, but without its caustic action. This is its chief advantage. In from 18 to 20 per cent. watery solution it checks epistaxis. Internally 0.5 gr. is of value in hematemesis. [As antipyrin has been successfully employed for local application in nosebleed, its combination with iron seems rational. But the value of ferropyrin in anemia as described by Cubash appears to need additional testimony.]

Cubash² has employed ferropyrin in those cases in which in addition to iron an analgesic was required. He prescribed it in a from 0.3 to 0.6 per cent. solution, and gave it three to four times daily in doses of 0.05 g. It caused no gastric disturbances. In acute anemia and in chronic diarrhea as much as 0.15 g. was given. The rapid disappearance of all the subjective symptoms of chlorosis was remarkable, even after relatively small doses. The appetite soon improved, the menses became regular, the edema disappeared, and the general condition improved. The author attributes the prompt action of ferropyrin to its solubility, and to the ease with which it is decomposed. The astringent action in diarrhea is probably due to the chlorid of iron.

Formaldehyd.—Slater and Rideal³ report a series of experiments on the use of this substance as an antiseptic and germicide. Formaldehyd is a gas with a pungent odor. It is readily soluble in water, forming a clear, stable, practically nonpoisonous solution. It combines readily with hydrogen sulphid and with volatile compounds derived from ammonia, and therefore acts as a deodorant. One per cent. solutions required less than fifteen minutes to kill the bacillus anthracis and spirillum cholerae; between fifty and sixty minutes to kill the staphylococcus pyogenes aureus and the bacillus typhosus. A 1:1000 solution proved very effectual in disinfecting soiled and infected clothing if allowed to remain in it overnight, while it had no ill effect on the clothing itself. Putrefactive organisms were not destroyed in twenty-four hours by solutions of this strength. The vapor also proves itself a powerful disinfectant, and from its harmless character and the freedom from damage of articles exposed to it, and its ready volatility, it would seem peculiarly adapted for the disinfection of rooms.

Gallanol is a white crystalline compound derived from tannin and anilin. It has been used with advantage in diseases of the skin, particularly in eczema and psoriasis, in the form of an ointment. It is not irritating, even when applied in the form of powder. Bacteriologic experiments, made by Cazeneuve, Rollet, and Nicolas show that in excess gallanol completely destroyed the vitality of the bacteria experimented on—the staphylococcus aureus, the bacillus pyocyaneus, the typhoid bacillus, the bacillus coli com-

¹ Centralbl. f. innere Med., No. 16, 1895, from Munch. med. Woch., 1895.

² Ibid., No. 18, 1895, from Wien. med. Presse, No. 7, 1895.

³ Univ. Med. Mag., July, 1894, from Lancet, April 21, 1894.

munis, and the bacillus of anthrax; that in a relatively weak solution their development was diminished; and that in an attenuated solution, while their growth was not materially affected, their pathogenic powers were destroyed. In vegetable parasitic diseases it was shown that the drug was of great value. It is absolutely nontoxic to the general system.¹

Glycerophosphates.—Robin² has studied the action of the glycerophosphates of calcium, sodium, and potassium, alone and in combination, administered by the mouth and hypodermically. In a case of neurasthenia, 4 gr. of glycerophosphate of calcium given hypodermically, increased the total solids in the urine. The urea was increased from 23.5 to 31.73 per cent.; on uric acid it apparently had no influence. From clinical experience he concludes that the glycerophosphates improve the general nutrition of the nervous system, and considers them indicated in nervous depression, phosphatic albuminuria, and phosphaturia. In locomotor ataxia they seem to give some relief to the lancinating pains.

Guaiacol.—Thayer³ of Baltimore, writing on the value of guaiacol applied externally as an antipyretic, concludes that the drug is readily absorbed; that its application is followed in most instances of fever by a gradual reduction in temperature, which reaches its lowest point between three and four hours after the application; that the fall of temperature is almost always associated with profuse sweating; that at a variable period, usually a short time after the lowest point is reached, the temperature rises rapidly, generally with marked chilly sensations, if not with an actual chill; that the amount applied should rarely exceed 2 c. cm. He finds that similar results follow the absorption of guaiacol through any other channel. Owing to the weakening effects of its continued use, and the disagreeable effects of its immediate application, Thayer thinks that its use as an antipyretic will be very limited. Casavovici and Miron Sigalea⁴ have used guaiacol mixed with tincture of iodine in the treatment of pleurisy, in the following proportions: tincture of iodine 385 grains, guaiacol 75 grains. The chest is thoroughly painted with it every night. The application is followed by a fall of the temperature, profuse perspiration, diuresis, and by a resorption of the fluid. Desplats,⁵ Brill,⁶ and others find that the local application of guaiacol relieves pain. Brill reports that he has used it to relieve pain in acute articular rheumatism, tubercular caries of the wrist, hysteria, locomotor ataxia, arthritis deformans, with excellent results and without the development of disagreeable symptoms. The painful part is first cleaned, then from 0.75–1.5 c. cm. of guaiacol are rapidly applied with a camel's-hair brush. After employing gentle friction the part is covered with a piece of gutta-percha. The analgesic effects come on gradually. In some cases the relief was permanent; in others the pain returned the next day. Desplats

¹ Intern. Med. Annual, 1895; N. Y. Med. Jour., March 24, 1894.

² Intern. Med. Annual, 1895, from Bull. de l'Académie de Méd., 1894.

³ Med. News, March 31, 1894.

⁴ N. Y. Med. Jour., March 3, 1894.

⁵ La Province méd., Feb. 3, 1894.

⁶ Centralbl. f. innere Med., Nov. 24, 1894.

uses equal parts of guaiacol and glycerin. Balzer and Lacour¹ report favorable results from the local application of guaiacol in the treatment of orchitis. The guaiacol may be applied pure over the region, but on the scrotum it is better to employ an ointment containing 5 parts of guaiacol and 30 parts of vaselin. The application gave rise to some burning sensation, lasting not longer than ten minutes. This was followed by complete relief of pain and subsidence of the general symptoms, including fever, so that repose and sleep became possible. A single application is often sufficient in mild cases, but even in severe cases they never found it necessary to repeat the application more than three or four times. The guaiacol did not appear to exert any resolving influence on the inflammatory exudate. In diabetes Clemens² administers from 3 to 10 drops of pure guaiacol in a tablespoonful of milk, or, if tolerated, in cod-liver oil, t. d. In order to determine more exactly its influence, he ordered no special diet. After the drug had been taken for about eight days, the urine showed very considerable reduction of sugar; in some the sugar was present in only small quantities; in others it had disappeared. After it had been taken for three or four weeks some starchy food could be administered without increasing the amount of sugar in the urine. The most marked effect, however, was in the reduction of the polyuria. In some cases this was reduced to one-half after the drug had been taken for eight days. The general condition improved in all cases and the remedy was well tolerated. [It can create no surprise to learn that guaiacol is of great service in diabetes, for the claim has been made at one time or another for about every remedy we possess. Like most of these, however, its anti-diabetic value lacks convincing proof.]

Hydrastinin Hydrochlorate.—This is a hydrochlorate of an artificial alkaloid derived from hydrastin. It is a yellow, somewhat deliquescent powder, freely soluble in water. It decreases the excitability of the psychomotor cortex of the brain, and at the same time has a depressant action on the spinal cord. Hydrastinin belongs to a group of poisons that affect not only the voluntary, but also the involuntary, muscles. In overwhelming doses it paralyzes the muscle-fibers, but the period of paralysis is preceded by a long period of excitement. According to Von Bunge, intestinal peristalsis is markedly increased by hydrastinin, while all observers have noticed that the blood-pressure is greatly raised. This increase of the pressure is due in part to direct stimulation of the heart, and in part, as was shown by the experiments of Archangelsky, to the direct action of the drug upon the muscular coats of the vessels. Marfori asserts that the contraction of the vessels in the kidneys may be so powerful as even to arrest secretion. Its sedative effect on the brain and on the cord should render hydrastinin a valuable remedy in cases of general feebleness and lack of circulatory power occurring in hysterical women and men. In the experience of H. C. Wood³

¹ Med. Press, March 20, 1895, from Med. News, May 19, 1894.

² The Year-book of Treatment, 1895, from Wiener med. Presse, No. 5, 1894.

³ International Med. Mag., Aug., 1894.

and others its action on the uterus resembles that of ergot, though it appears to be much more powerful. It is useful in all forms of menorrhagia. Kiselew has used it with alleged success in epilepsy. Cerna¹ states that it is best administered hypodermically in doses of from $\frac{1}{12}$ to $\frac{1}{2}$ of a grain. As it occasionally causes dryness of the throat, difficulty in swallowing, and violent pain in the neck, care should be exercised in its use.

Hydrogen Dioxid.—From experiments performed with hydrogen dioxid in order to ascertain the best mode of preparation and to determine its keeping qualities, Squibb² found that at ordinary temperatures and with ordinary agitation it is practically decomposed in eight weeks. Pressure exerts no restraining influence in this change. Boroglycerin, added in proportion of 1 per cent., retards decomposition, but does not prevent it. He recommends the extemporaneous preparation of hydrogen dioxid as required. It was discovered that when exposed to air at ordinary temperature, or when carefully heated on a water-bath to 140° F., the solution loses chiefly water, and can thus be concentrated so as to contain 50 volumes of the dioxid. If heated rapidly, sudden decomposition is likely to occur.

Ichthyol is recommended by Cohn³ in pulmonary tuberculosis. It is cheaper than creosote, and in many cases is better borne. He has used it during the past two years in more than 100 cases with good results, and calls particular attention to the remarkable effect it has on nutrition. He prescribes a mixture of equal parts by weight of ichthyol and water, and directs 4 drops to be taken t. d., before meals if it can be borne; if not, after meals. A little black coffee helps to cover the taste. The dose must be gradually increased by a drop daily, until 40 drops are taken at once; it should always be taken well diluted with water. The full dose must be continued for a long time. Garofalo⁴ states that he has successfully employed ichthyol hypodermically in chronic articular rheumatism, sciatica, and obstinate lumbar myalgia, adopting Damien's formula: Ichthyol 3 parts, sterilized water 100 parts. Of this from 0.5 to 2 c.c., according to the articulation affected, were injected during the height of the pain. A diminution of pain subsequent to this injection was observed, but never a complete suppression.

Iodophenin or iodophenacetin, introduced about three years ago by Scholwein, contains about 50 per cent. of iodine. It is formed as a dark-brown precipitate when a saturated cold solution of phenacetin, acidulated with hydrochloric acid, is mixed with iodine. By recrystallization from glacial acetic acid it can be obtained in steel-blue crystals. The compound has a faint iodine-odor and an acrid, burning taste, and colors the skin yellow. It is almost insoluble in water, difficultly soluble in benzene and in chloroform, easily so in alcohol and in glacial acetic acid. It melts and decomposes at from 130° to 131° C. According to Wittkowsky's researches, it

¹ Notes on the Newer Remedies.

² Ther. Gaz., May 13, 1894, from Ephemeris, Jan., 1894.

³ The Year-book of Treatment, 1895, from Lancet, 1894, i. 1521.

⁴ Am. Med.-Surg. Bul., June 15, 1894, from Rif. Med., 1894, No. 30.

possesses important antibacterial properties. It has been used experimentally at the Charity Hospital in Paris with good results, but Siebel finds an objection to its use in its strong evolution of iodine; subcutaneously it causes inflammation, and internally it affects the digestive tract. Recently Schüller¹ has experimented with it in the treatment of purulent and infected wounds, and finds that here it equals mercuric chlorid and iodoform. As iodine is so easily liberated, it is contraindicated in fresh wounds. Ichorous ulcers of the legs became dry and aseptic after the second dressing with iodophenin, and iodoform then accomplished a prompt cure. It must not be overlooked that iodophenin exerts a slightly caustic action on the granulations. After the wounds have become clean under the use of iodophenin the latter is best replaced by iodoform. Iodophenin was also found serviceable after operations to prevent decomposition of secretions in contact with bandages. In these cases it is preferable not to sprinkle the wounds directly, but to sprinkle it between the diverse layers of the cotton dressing. These dressings may be left in place for from two to three weeks without becoming putrid, even in cases of very abundant secretions from septic wounds. In the treatment of ulcers it can be prescribed in powder or in the form of an emulsion with glycerol. Schüller uses iodophenin collodion in place of iodoform collodion; he considers it superior to the latter, as it is almost inodorous when dry.

Iron.—Our ideas concerning the action and absorption of iron seem likely to require modification, for at the meeting of the Thirteenth Congress of Internal Medicine, in Munich, Bunge² of Basel discussed the origin of iron in the body. He says that it is a mistake to suppose that the iron prescribed medicinally is taken up and applied to the building up of hemoglobin. The researches of Glycinski, Hamburger, Schmiedeberg, and F. Voit have shown that it is extremely improbable that the inorganic iron preparations are absorbed in an appreciable amount by the alimentary tract. Bunge comes to the conclusion that iron is only taken up and used to make hemoglobin in some peculiar organic form. This substance he found in the yolk of eggs in the form of a nuclealbumin, and named it hematogen. Hematogen is to be found in milk and in vegetables. While the latter are very rich in iron, the former contains very little iron. That new-born animals should be supplied with such iron-poor food seems strange. The explanation is that the new-born contain an excess of iron stored up in their tissues—that this lasts until they are weaned. In rabbits, for example, he found 18 g. of iron at birth, and only one-sixth this amount three weeks later. Though organic iron compounds are absorbed, Bunge considers it very doubtful if they are assimilated. On the other hand, he says that in about ten days the ordinary food will convey to the organism iron equal to one-third that in the blood. In other words, the food always contains enough iron to supply the needs even of the very anemic. He recommends

¹ Am. Med.-Surg. Bull., July 1, 1894, from *Vratch*, No. 2, 1894.

² *Deutsch. med. Woch.*, April 25, 1895, and *Med. Rec.*, May 18, 1895.

a diet largely composed of vegetables as the best means of administering iron. The apparent utility of iron in therapeutics, he thinks, is largely a matter of suggestion. Macallum¹ calls attention to the fact that Bunge's researches have in recent years done much to unsettle the medical dogma that the iron contained in drugs enters directly into combination with the red corpuscles to form hemoglobin. Regarding the theory of the direct conversion of iron-containing nucleins in the food ("hematogen") into hemoglobin as extremely doubtful, the author has attempted to determine, first, whether or not inorganic compounds of iron are absorbed, and secondly, whether certain organic compounds of iron are absorbed. Although the experiments under the second head are not yet completed, the following conclusions are submitted: 1. The experiments on the administration of inorganic compounds of iron to guinea-pigs and other animals have resulted in showing that the intestinal mucosa absorbs these to an extent that varies with the nature of the compound and the quantity given. When the dose is small absorption occurs only in that part of the intestine adjacent to the pylorus and measuring only a few inches in length; but when the quantity given at any one time is large the absorptive area may embrace the whole of the small intestine. In the former case the result appears to depend on the complete precipitation, as hydroxide, of the iron of the salt unabsorbed, in the thoroughly mixed bile, chyme, and pancreatic juice; in the latter case the large amount of the iron salt apparently first destroys the alkalinity of these fluids, the excess of the salt unaffected and remaining in solution then undergoing absorption. 2. The intestinal epithelial cells transfer the absorbed iron at once to the underlying elements when the amount is small, but with a large amount absorbed the epithelial cells are found to contain some of it. 3. Though some of the subepithelial leukocytes of the villi appear to carry part of the absorbed iron into the general blood-circulation, probably the more important agent in the transference of the inorganic iron from the villi to other parts of the body is the blood-plasma. 4. Marfori's albuminate and the commercial "peptonate" of iron, when administered to guinea-pigs, seem to stimulate the leukocytes to invade the epithelial layer of the intestinal villi. 5. Of the organic iron compounds belonging to the "chromatin" class, that found in egg-yolk (hematogen of Bunge) undergoes absorption in the intestine of the guinea-pig and of amblystoma. In these, but more especially in the latter, after they are fed with egg-yolk for several days the cytoplasm of the liver-cells yields a marked evidence of the presence of an organic iron compound belonging to the "chromatin" class and derived from the yolk-feed. 6. The mode of absorption of yolk "chromatin" is obscure, but the process appears to be in some way connected with the absorption of the fat with which the iron compound is closely associated in the yolk. Kobert² discusses the dietetic significance of iron, and estimates the total daily need of the body for iron at 50 mg. He points out that, thera-

¹ Am. Jour. Med. Sci., Sept., 1894, from Jour. of Phys., Nos. 3 and 4.

² The Year-book of Treatment, 1895, from Deutsch. med. Woch., July, 1894.

peutically, vegetable food-stuffs are not as appropriate for the formation of hemoglobin as the animal food-stuffs, and that milk can only rarely yield the necessary supply of iron in disease, as its ferruginous constituents are with difficulty decomposed by the digestive fluids. He considers that preparations containing blood in a form intermediate between hemoglobin and hematin are absorbed in a useful form, and recommends for adoption two substances obtained by the action of reducing agents upon blood, which he terms hemogallol and hemol. In a very interesting and valuable paper on the pathology and therapy of chlorosis Von Noorden¹ of Frankfort discusses the action of iron in the treatment of anemia. He states that as the researches made by himself, by G. Hoppe-Seyler, and by A. E. Garrod show that there is no increase, in chlorosis, in the excretion of iron either in the urine or in the feces, the cause of the anemia cannot be due to an abnormal destruction of hemoglobin, but must depend on an inefficient hematopoietic function. With regard to the absorption of iron which lately has engaged so much attention, he criticizes the assertions of Bunge and Kobert that iron is not absorbed, as after the administration of iron they were unable to find an increased excretion of iron in the urine. Bunge states that only iron in combination with nucleoalbumin is absorbed; that in health enough is taken in with the food to satisfy the animal economy; that in chlorosis, owing to an excessive production of sulphuretted hydrogen in the intestines, this compound is broken up and an insoluble iron sulphid is formed. If an organic or an inorganic salt of iron is now given, the sulphuretted hydrogen will unite with this salt, leaving the nucleoalbumin compound unchanged. This theory Von Noorden claims is not tenable. Rethers's investigations² prove that the ethereal sulphates (indoxyl-, phenol-, skatoxylsulphates), which are always increased in the urine if there are excessive putrefactive changes in the intestines, are increased in chlorosis only when there are intestinal complications. Further, Von Noorden states that iron independently of the nucleoalbumin compound is absorbed. Iron is not normally excreted by the urine. Iron administered hypodermically (Jacobi) is not excreted, but is stored up in the liver and the spleen. From these organs it is gradually distributed to the system, to be finally excreted by the intestines. Gottlieb and Kunkel have demonstrated that iron is absorbed even when given by the mouth. They fed dogs and mice on iron salts, and found that the livers of these animals were much richer in iron than were the livers of the control animals. The next question discussed by the author is, How does iron cure? As the absorption in chlorosis is usually good, it must be supposed that the organic iron of the food is absorbed, but not made use of. The reason for this, the author thinks, is that the hematopoietic organs are depressed in such a way that they are unable to make use of the iron contained in the blood, just as in rickets the diseased tissues are unable to make use of the lime-salts with which they are continually bathed. Von Noorden concludes that the blood-forming organs require an irritant; that iron salts circulating in the blood

¹ Berlin. klin. Woch., March 4, 1895.

² Dissert., Berlin, 1891.

exert a powerful irritation on the hematopoetic cells of the marrow, and that thereby there is an improvement of the quality of the blood; that the organic iron salts taken in with the food are so slightly irritant that they fail to stimulate the blood-making organs. If organic salts of iron are given, however, in sufficient quantities, they are capable of stimulating the blood-making organs. The author in support of this theory cites the well-known effect of arsenic on anemia. This action is entirely due to its irritant effect on the hematopoetic organs, for it does not enter into the composition of hemoglobin. He concludes that iron is one of many means by which the hematopoetic organs may be stimulated, and that its chemic relation to hemoglobin is unimportant.

Kola.—E. B. Smith¹ states that the value of this drug is due to the alkaloids theobromin and caffein and to the principle known as kolanin. In atonic diarrhea its combined astringent and tonic properties produce most satisfactory results. In the treatment of summer diarrhea in children it takes the place of opium, with none of its disadvantages. It aids digestion by increasing the activity of the salivary glands, augments the output of the digestive fluids, and is, therefore, beneficial in that form of dyspepsia which accompanies diarrhea. As it exerts a sustaining effect upon the vasomotor system, it is an important remedy in the treatment of children with diarrhea when the circulation is enfeebled. When long-continued exertion is demanded and little food is obtainable, it seems to possess sustaining properties similar to those of coca. It lessens tissue-waste, as is shown by the diminished excretion of urea. Upon the circulation it is a tonic stimulant; the pulse is increased in strength and frequency. It is also slightly diuretic. In alcoholism it may take the place of liquor, enabling the patient to withstand the craving for alcoholic stimulants. It aids in overcoming the indigestion, and is beneficial in relieving the vomiting. In pulmonary tuberculosis it is said to lessen the cough. In pulmonary hemorrhage it is useful. Locally, it appears to be an astringent. [It would seem that the action of kola in diarrhea is scarcely so valuable as would appear from the report, and its administration in pulmonary hemorrhage should not be allowed on account of its action in producing circulatory excitement.]

Lactophenin is a colorless, slightly bitter powder, soluble in 500 parts of cold water and in 55 parts of hot. Chemically, it is closely allied to phenacetin. Strauss² of Giessin and Landowsky³ have made a careful study of its antipyretic, analgesic, and sedative properties. Observations were made by Strauss in 45 cases. In 2 cases (pneumonia, typhoid) an evanescent eruption of an angioparalytic nature appeared. He regards it as a safe and reliable antipyretic and analgesic. Roth⁴ has used it in 20 cases of acute rheumatism. After its administration he noticed in some cases

¹ Am. Jour. Med. Sci., April, 1895, from Am. Therapist, No. 7, 1895.

² Therap. Monat., Sept. and Oct., 1894.

³ Brit. Med. Jour., Sept. 17, 1894, from Sem. méd., Feb. 7, 1894.

⁴ Edinb. Med. Jour., Dec. 1894, from Wien. klin. Woch., Sept. 13, 1894.

a temporary feeling of weight and heat in the epigastrium, and occasionally cyanosis without other symptoms. The dose varied from 1 to 6 gr. daily. The author states that the pain and swelling disappeared generally within from twenty-four to forty-eight hours, that the temperature continued low, that no unpleasant by-effects were observed. Von Ziemssen¹ writes that clinical experience with this drug is still too limited to pronounce definitely on its therapeutic value.

Lysidin (methylglyoxalidin) is a hygroscopic crystalline, strongly alkaline substance of a pinkish color, evolving an odor of mice. It is said to be 5 times stronger as a solvent of uric acid than piperazin. Grawitz² of Gerhard's clinic reports 2 cases of gout, 1 acute, the other chronic, in which this drug was used with excellent results. The daily dose varied from 1 gr. to 5 gr., given in seltzer-water. No increase in the excretion of uric acid was observed. In the case of chronic gout tophi were seen to disappear under its use, and movement of the affected joints became painless. In a case of acute rheumatism lysidin was without effect.

Lysol is made by dissolving in fat and saponifying with alcohol that part of oil of tar which boils between 190° and 200° C. It is a clear, brownish, oily fluid smelling like creolin. Anschütz and Pohl³ recommend it as an efficient antiseptic. It forms a clear soapy solution in water, and possesses in solutions of from 3 to 5 per cent. a strong antiseptic power. It does not irritate the surgeon's hands, is only slightly toxic, and is cheap. By authorities a 1 per cent. solution has been recommended as an injection in blennorrhagia.

Magnesium Sulphate.—In September, 1893, Rohé and Wade⁴ reported that they had used this drug hypodermically as a purgative with the result that in 67 per cent. of the cases the injection was successful and in 33 per cent. it failed. The dose varied from 1.86 to 4.5 gr. The injection was followed by an evacuation in from three to fourteen hours. Similar experiments were afterward made by Fincke,⁵ who reported failure in 82 per cent. and success in only 18 per cent. J. Wood and A. C. Howe⁶ have made some further observations with magnesium sulphate hypodermically administered, and claim that the results were successful in 70 per cent. of the cases; 20 per cent. required more than one injection; 10 per cent. resulted in failure. They injected from 2 to 3 gr. of the salt in a freshly-made solution in the nates or the calf of the leg. In most of the cases there was a movement from the bowels within ten hours. The contradictory results obtained by Fincke are possibly to be attributed to the fact that he made his solutions from hypodermic tablets of magnesium sulphate that were evidently not of a reliable make, as experiments undertaken by Wood with

¹ Münch. med. Woch., Dec. 11, 1894.

² Brit. Med. Jour., Nov. 10, 1894, from Deutsch. med. Woch., Oct. 1, 1894.

³ Therap. Gaz., Aug. 15, 1894, from Deutsch. med. Zeitschr., June, 1894.

⁴ Univ. Med. Mag., Oct., 1894.

⁵ Med. News, Aug. 25, 1894.

⁶ Therap. Gaz., Jan. 15, 1895.

the same tablets proved most unsatisfactory. Though in a certain proportion of cases the drug when administered subcutaneously acts favorably, its action is too uncertain to render this method of using magnesium sulphate of much value.

Malakin results from the combination of salicylic aldehyd and parphenetidin, and occurs in small, needle-like crystals of a yellow color, insoluble in water. Four grains correspond to a little less than 2 gr. of salicylic acid. Merkel¹ has tried malakin in 18 cases—15 of acute rheumatism, 2 of typhoid fever, and 1 of neuralgic pains of typhilitis. Its action is very mild; a profuse perspiration usually follows its administration; the quality of the pulse suffers occasionally. It has a distinct though temporary antipyretic effect. In the cases of rheumatism a favorable effect was noted in 9, and in 2 of these other remedies had been used without effect. Jaquet² of Basel finds that the drug produces a reduction of temperature, which, unlike that produced by antipyrin and acetanilid, comes on gradually. He states that after the administration of 15 gr. the temperature began to fall in from one and a half to two hours, and reached its lowest point from four to six hours later. A repetition of the dose is followed by an increase of effect. Germani³ concludes from his experience with malakin in 8 cases of acute rheumatism and in various cases of neuralgia and fever that malakin is a good antirheumatic; that it is free from the unpleasant by-effects attending the use of older compounds of salicylic acid; that it is especially to be recommended in those having an idiosyncrasy toward those preparations; and that as an antipyretic and antineuralgic it is inferior to those in ordinary use. Bauer⁴ confirms the foregoing observations. He states that as much as 6 g. are required to produce an effect in rheumatism.

Intravenous Injections of Mercuric Chlorid.—At the eleventh International Medical Congress in Rome, Baccelli⁵ related his experience with mercuric chlorid, given by intravenous injections in the treatment of syphilis. Experiments on animals were made. He then tried the new method in 2 cases of cerebral syphilis which had resisted cure by inunctions and hypodermic injections of mercury and potassium iodid in large doses. The results proved excellent. The method is now employed by many Italian physicians. The solution Baccelli employs is as follows: Mercuric chlorid 1 part, sodium chlorid 3 parts, distilled water, 1000 parts. The skin is first cleansed and rendered aseptic; a syringe of the solution is then injected into a vein at the elbow, back of the hand, or the thigh. The veins are first made prominent by constriction. The injection must be made into the lumen of the vein, otherwise pain and swelling will result. In

¹ Therap. Gaz., July 16, 1894, from Münch. med. Woch., April 24, 1894.

² Ibid., May 15, 1894, from Jour. de Méd. de Paris, Feb. 25, 1894.

³ Brit. Med. Jour., Sept. 1, 1894, from Gaz. d. Ospedali, July 24, 1894.

⁴ Am. Med.-Surg. Bull., June 15, 1894, from Centralbl. f. ges. Ther., xii., 1894. See also N. Y. Med. Jour., March 2, 1895.

⁵ Therap. Gaz., June 15, 1894, from Berlin. klin. Woch., March 26, 1894.

about five minutes mercury is excreted by the saliva. The "cure" begins with injections of 1 mg. of mercuric chlorid daily—1 c.cm. of the solution. The quantity is gradually increased to 8 mg. With the larger doses he employs a 2 per cent. solution, in order to avoid the injection of too large a quantity of fluid. In exceptional cases he begins with 4 or 5 mg. Baccelli calls special attention to the following points: (1) The small quantity required; (2) the possibility of overcoming many symptoms quickly—symptoms that indicate direct blood-poisoning with the syphilitic virus; (3) the benefit resulting from the local action on the vessel-walls that are so frequently diseased. At the Dermatologic Society of Berlin, Lewin¹ showed several patients who had been treated by intravenous injections of mercuric chlorid, after Baccelli's method. The principal objections were that it was difficult to find a suitable vein, and that the cannula was so easily forced through the vein selected into the neighboring tissues. The best method is, having inserted the needle, to see that the blood flows from the cannula, and only to make the injection after being convinced of this fact. The danger of thrombosis must be borne in mind, though Lewin had never observed such an accident. He found the effect of mercuric chlorid to be much more pronounced after intravenous than after intramuscular injections. No ill effects had been observed, either on the kidneys or on the intestines. In a case of rupia of two months' duration a cure was effected after six injections, while in another case in which it was tried for gummata on the end of the nose a single injection caused them to disappear. The method is not one to be employed in out-patient departments, and it is more easily practised in men than in women, an account of the veins being more prominent in the male sex. Unna,² after experimenting with this method on animals and on 6 cases of syphilis, concludes that the method is not easily carried out, and that it is not unattended with danger, as in 1 of his cases thrombosis of the injected vein occurred. He states that he found the specific action of the drug to be no prompter than after its administration in the usual ways.

Coryl.—Both ethyl chlorid and methyl chlorid having been used as local anesthetics, their combination, though scarcely possessed of striking advantages, is not unreasonable. To this combination the name of coryl has been given. The preparation is made by Joubert,³ and consists of a mixture of methyl chlorid (the boiling-point of which is -22° C.) and ethyl chlorid ($+10^{\circ}$ C.). The boiling-point of the mixture is about 0° C. Coryl comes in a metal cylinder, called a coryleur, provided with a capillary orifice and closed with a suitable faucet. In using the agent the cylinder is held in the hand and inverted with the point directed to the part to be anesthetized. The vapor is inflammable. Coryl can be used without fear of producing any bad after-effects on the tissues. It can be used about the mouth, and according to Tison renders many minor operations, as the extraction of teeth, painless.

¹ The Year-book of Treatment, 1895.

² Deutsch. med. Wech., April 25, 1895.

³ Jour. de Méd. de Paris, July 1, 1894.

Methylene Blue.—Austin Flint¹ reports a case of *filaria sanguinis hominis* with chyluria which he successfully treated with this drug. Before the treatment was begun microscopic examination of the blood showed the embryonic filariæ to be present in large numbers. After the administration of 2 grains of methylene blue every four hours for twelve hours only two parasites were to be found in the blood; these were deeply stained with blue and their movements were very sluggish. The urine was now clear, but intensely blue. Although the treatment was discontinued, the blood remained free from parasites until the ninth day. On the eighth day the urine became milky, and on the following night a large number of filariæ were found in the blood. The treatment was resumed and continued for five days. A year has now elapsed, and there has been no return of the disease. The author states that he has used methylene blue with success in malarial enlargement of the spleen, in chronic cystitis, and in a few cases of gonorrhea. The usual dose given varied from $1\frac{1}{2}$ to 2 gr., in capsules, two or three times a day. Occasionally irritation of the neck of the bladder attends its use, but this can be easily overcome by adding about 30 gr. of nutmeg to each dose. In malaria Flint finds that the good effects are not so lasting as when quinin is given. During the last four years methylene blue has been quite extensively used in the treatment of malaria. As it seems to be uncertain in its action, and as its use is frequently attended with distress to the patient on account of the occurrence of gastric symptoms and strangury, its employment as an antimalarial is not to be recommended. [The success which followed the use of methylene blue in the case of filariasis reported by Flint would seem to warrant an extended use of the drug in regions where the disease is prevalent. To the value of methylene blue in cystitis and pyelitis there is an abundance of testimony.]

Migrainin.—This is a mixture of caffein, antipyrin, and citric acid. One g. contains 0.09 caffein, 0.85 antipyrin. Ewald² has tried it with success in a large number of cases of migraine. It should be taken on the appearance of the premonitory symptoms, and perfect rest should be maintained for one or two hours. No food should be taken. If relief does not follow in half an hour, the dose should be repeated. In most cases complete relief is obtained within an hour. Subsequent attacks are relieved as promptly as the first. Wobern-Wilde³ reports a case of poisoning after the ingestion of 1.1 g. of this drug taken for the relief of headache. The symptoms observed were trembling of the limbs, profuse perspiration, chilly sensations, pain in the epigastrium, vomiting, and marked prostration. The lips were cyanotic and the pulse was small and infrequent. Recovery followed after active stimulation.

Myrrholin⁴ is simply a solution of myrrh in its own weight of oil. Given in capsules containing 3 gr. of myrrholin and $4\frac{1}{2}$ to 5 gr. of

¹ N. Y. Med. Jour., June 15, 1895.

² Jour. de Méd. de Paris, Dec. 30, 1894.

³ Therap. Monats., May, 1895.

⁴ Int. Med. Ann., 1895, from N. Y. Med. Jour., July 21, 1894.

creosote, it is said to have proved useful in tubercular laryngitis. An ointment of 1 part of myrrhohin and 2 parts of vaselin is also said to act favorably in cases of eczema about the nostrils.

Naphtholate of Sodium is a product of sodium hydrate and beta-naphthol. It is an odorless powder, soluble in water in the proportion of 1 to 3. In this strength it forms a brownish solution, but a solution of 3 to 4 per cent. is nearly colorless and tasteless. The powder should be kept from the light, but the solutions are said to be stable. Cozzolino¹ of Naples recommends it as a valuable antiseptic and antisyphilitic in ear and nose diseases. It is claimed that a 3 per cent. solution is as efficacious as 1 : 2000 mercuric chlorid solution. In the ear the author has found it to be twice as prompt as boric-acid solutions in controlling suppuration. In the nose he uses a $\frac{1}{2}$ to 2 per cent. solution or a weak ointment.

Nucleins.—This subject has been most thoroughly discussed by Vaughn² in a paper on "Nucleins and Nuclein Therapy." He describes their characters as follows: "Physiologically, nucleins may be said to form the chief chemie constituent of the living parts of cells. Speaking broadly, we may say that the nuclein is that constituent of the cell by virtue of which this histologic unit grows, develops, and reproduces itself. It is the function of the nuclein of the cell to utilize the pabulum within its reach. It must be evident that those tissues most abounding in cellular elements contain relatively the largest amounts of nuclein. It must also be seen that it is by virtue of their nuclein that the cells of various organs and organisms possess and manifest their individual peculiarities. We should therefore expect to find that nuclein of the yeast-cell is not identical with that of the bacillus tuberculosis, and that the nuclein of the spleen differs from that of the thyroid gland. The number of kinds of nuclein is limited only by the varieties of cells. Nuclein is the chemie basis of that part of the cell designated by the histologist as the nucleus, sometimes called chromatin on account of the readiness with which it absorbs and holds coloring agents. It is the nuclein of bacterium which takes up and retains the stains, and it is on account of the fact that the nuclein of the bacillus tuberculosis differs from that of other bacilli that we are able to distinguish the former from the latter by its tinctorial properties. Differences in reaction with staining reagents, so plainly seen under the microscope, are only outward manifestations of less apparent and more important differences in chemie composition. Chemically, the nucleins are complex, proteid bodies, characterized especially by the large amount of phosphorus that they contain. The phosphorus exists in the form of nucleinic acid, which is combined with a highly complex basic substance. So far as we know at present the nucleinic acid of all nucleins is the same, yet the basic part differs in the various nucleins. This basic substance yields, as decomposition-products, one or more of the so-called xanthin bodies—adenin, guanin, sarkin, and xanthin. Some nucleins yield

¹ Int. Med. Ann., 1895, from Therap. Gaz., May, 1894.

² Jour. Am. Med. Assoc., June 9, 1894.

only adenin, and these may be designated as adenylnucleinic acids. Those that furnish xanthin most abundantly may be called xanthynucleinic acids. Generally speaking, the nucleins are insoluble in dilute acids and soluble in dilute alkalis. They resist peptic digestion and in this way may be separated from most other proteid bodies."

[For a long time it has been known that the blood possessed marked germicidal properties—that, for instance, many species of bacteria when injected into the circulation of an animal soon completely disappeared from the blood. To account for this various theories have been advanced from time to time. Metschnikoff supposed that the disappearance of the bacteria was due to the vital activity of the leukocytes—that they acted as phagocytes and actually devoured the bacteria. Buchner (1889) proved that the germicidal property of blood of rabbits and dogs did not depend on the presence of the cellular elements, but that it is present in clear serum, and that it is due to the presence of proteids. These he has named "alexins." Hankin (1892) concludes that these proteids are the product of certain leukocytes, the eosinophile cells of Ehrlich. In his latest communication on the subject Buchner (1894) attributes the origin of the germicidal proteid in blood-serum to the leukocytes. In 1892, Emmerich, Tsuboi, Steinmetz, and Löw from experiments concluded that the germicidal property depended on an alkaline serum-albumin. Zagari and Innocente (1892) also came to the conclusion that the alkalinity was an important factor in accounting for this power. In this connection it is interesting to note that in certain infectious diseases, especially in pneumonia, a marked increase in the number of leukocytes occurs, and that this increase, at least in pneumonia, seems to indicate a favorable prognosis. The most recent researches on the subject seem to prove that the germicidal property of the blood is not directly due to its alkalinity, but to the fact that the germicidal agent is only soluble in an alkaline medium. This view is supported by Vaughn, McClintock, and Kossel. They have demonstrated that the germicidal constituent of the blood is a nuclein, and that this nuclein is undoubtedly furnished by the polynuclear white cells. Nuclein has therefore been introduced as a therapeutic agent in the hopes that the germicidal property of the blood may be increased by its means sufficiently to neutralize the poisons of infectious diseases and that the resisting powers of the tissues may be augmented.] Vaughn, in an address delivered before the Illinois State Medical Society, states that in tuberculous patients the effect of repeated injections has been to lower the temperature. He has used daily injections of nuclein for six months or more without observing any injurious effects from its administration. In a case of indolent ulcer of the leg, after eight injections of a 2 per cent. solution of yeast-nuclein, he reports that the ulcer healed perfectly, and that two months after the last injection there was no return of the trouble. John Aulde,¹ who has used nuclein in a large number of cases,

¹ N. Y. Med. Jour., Sept. 29, 1894. See also Sternberg: Immunity and Serum-therapy, 1895.

states that it is useful in all forms of anemia, in chronic and recurrent malaria, in digestive disorders, and in acute and chronic pulmonary affections. In a case of nephritis treated by nuclein he observed that the amount of urine increased, that the percentage of albumin fell, and that the edema diminished. He finds that its administration creates a feeling of mental buoyance. As leukocytosis is defective in typhoid fever, Aulde suggests that nuclein may prove valuable in the treatment of this disease. The dose is $\frac{1}{3}$ of a minim of the standard solution adopted. It is best given in tablets, and can be repeated every hour if necessary. For a child he prescribes $\frac{1}{3}$ of this quantity. Hypodermically, he gives much larger doses, from 5 drops to 1 dram. It is not toxic. Vaughn uses a nuclein obtained from yeast. Brewer's yeast is extracted with dilute alkali and filtered, and the filtrate precipitated with dilute hydrochloric acid. The precipitate is redissolved in alkali and reprecipitated with acid several times, and is finally dissolved in 0.25 per cent. of potassium hydrate. Aulde prefers a nuclein obtained from the thyroid and thymus glands.

Ozone.—Thompson¹ of New York has made a number of experiments with ozonizing agents, given by the stomach and injected directly into the intestine or the blood. He concludes as follows: 1. When injected in the circulation in full strength—*i. e.* 15 volumes per cent.—they have a very destructive action upon the blood, thereby ultimately having the effect of reducing agents rather than of oxidizing agents for the tissues. 2. Acting through the stomach or intestine, they may similarly affect the blood, and in addition they destroy the gastric and intestinal mucous membrane. 3. Given in medicinal doses by the stomach, their only benefit, if any, consists purely in their local action in the alimentary canal in possibly preventing abnormal fermentations. 4. If so used, care should be exercised, owing to the great variability in strength of different preparations. 5. Ozone is of no real value to the tissues, whether inhaled or drunk in fluid preparations, and it may be exceedingly harmful.

Paraformaldehyd.—This substance, formed by the union of 3 molecules of formic aldehyd, is a white, indistinctly crystalline mass almost insoluble in water. It can be administered in large doses, 75 gr. a day, without bad effects. As an internal antiseptic it is said to be superior to iodoform, betanaphthol, salol, and bismuth salts. Its antiseptic properties are probably due to the elimination of formic aldehyd vapor.²

Pental.—The production of general anesthesia for dental operations by means of pental is the subject of a paper by T. E. Constant.³ Pental or isoamylene is a colorless liquid, insoluble in water, but mixes readily with chloroform, ether, and alcohol. It is extremely volatile and inflammable. It has a disagreeable odor, but is so little irritating that the pure vapor can be inhaled. To induce anesthesia pental is best employed by means of an apparatus somewhat on the principle of the Ormesby inhaler. The duration

¹ Med. Rec., March 3, 1894.

² Canadian Prac., Sept., 1894.

³ Therap. Gaz., Aug. 15, 1894, from Lancet, Apr. 28, 1894.

of the anesthesia produced varied from one to three minutes. There was no muscular relaxation. In about 5 of the 140 cases in which it was used the patients declared that they were perfectly conscious throughout, but that they felt no pain. No after-effects were observed when pental was administered in this way. The author, however, had seen cases in which dangerous symptoms arose and had heard of 3 fatal cases. He regards it as decidedly more dangerous than nitrous oxide, but considers it far safer and more convenient than chloroform as an anesthetic in dental surgery. Hare¹ states that the quantity to be employed is 2 to 3 drams, and that it is extensively used in the Children's Hospital of Berlin.

Peppermint-inhalation: The Effect on Experimental Tuberculosis.—Experiments have been made by Baldwin,² under the direction of Trudeau—1. To test the effect of the vapor of peppermint oil upon pure cultures of bacillus tuberculosis; and 2. To test its influence on the course of the disease in animals inoculated by the trachea and kept in an atmosphere charged with the vapor. The results seem to warrant the following conclusions: 1. Although ol. menth. pip. may prevent bacillus tuberculosis from growing in a test-tube, its parasitic existence is not hindered by a constant inhalation of the strong vapor of peppermint. 2. Although it has a high power of diffusion, its local antiseptic action in the respiratory tract is probably slight, both on the tubercle-bacillus and on other bacteria.

Phenocoll is a compound closely allied to phenacetin. It occurs in a fine white powder freely soluble in water. The dose is from 5 to 8 gr. two to five times a day. Archangelo³ summarizes his experience with the drug as follows: It is a powerful antimalarial agent, a worthy supplement of quinin; it is valuable in acute rheumatism, but useless in chronic; it is of great value in infantile therapeutics, especially in cases of malaria, typhoid fever, or rheumatism; it is a good intestinal antiseptic; it is of little use as an antineuralgic. Ribet⁴ also reports curative results from its use in remittent fevers. He prescribes 2.0 g. in solution to adults three to five hours before the paroxysm. Its administration should be continued for from six to seven days. To children he gives from 0.5 to 0.75 g. The antimalarial property of phenocoll seems to be thoroughly established. It appears to act as efficiently as quinin, and, moreover, possesses the advantage over the older drug of not producing disagreeable by-effects.

Picrotoxin.—Semmla and Gioffredi,⁵ in a paper on the means of controlling sweating, state that it is no longer permissible to prescribe the antihydrotics empirically, but that first an exact diagnosis must be made. Excessive secretion of sweat may be due to irritation of the vasomotor nerves, or may occur independent of these, and even when the vasoconstrictors are stimulated. The existence of special sweat-secreting nerves has been proved.

¹ *Prac. Therap.*, 1894.

² *N. Y. Med. Jour.*, May 18, 1895.

³ *Univ. Med. Mag.*, Sept., 1894, from *Rif. Med.*, March 29, 1894.

⁴ *Therap. Monats.*, Feb., 1895.

⁵ *Centralbl. f. Innere Med.*, No. 18, from *Rif. Med.*, No. 298, 1894.

In the cat the centers for these nerves are in the lumbar and cervical regions of the cord and in the medulla. According to the various causes of hyperidrosis the treatment differs. If it is due to lack of tone in the peripheral vessels, hydrotherapy is indicated. If hyperidrosis depends on irritation of the central sweat-centers, then those drugs, as agaricus, agaricin, and atropin, which paralyze these centers, should be employed. In paralysis of the vasomotor system, which is accompanied by other vasomotor symptoms beside sweating, picrotoxin is the remedy. The authors report such a case following influenza which was quickly relieved by picrotoxin. One-half mg. was given twice a day, and within eight days all the symptoms, which had long resisted treatment, had disappeared. [The empiric use of anhydrotics has too long been practised, and the paper of these authors serves to give reason to the employment of drugs long used in the relief of sweating.]

Potassium Bichromate.—In a paper read before the International Medical Congress at Rome, Frazer¹ described his experience with this salt in the treatment of chronic gastritis. He also records 10 cases of gastric ulcer which yielded very satisfactory results with this remedy. The drug was given in pill form or in solution in doses varying from $\frac{1}{12}$ gr. to $\frac{1}{8}$ gr. three times a day. It should be given in as empty a condition of the stomach as possible. His records show that under the administration of potassium bichromate the pain, nausea, vomiting, and gastric tenderness are relieved, but that the constipation and the anemia encountered in dyspepsia are not influenced. In ulcer of the stomach with hematemesis the results were not favorable, as it did not control the bleeding. It is important to note that in larger doses than those mentioned by the author the drug will produce serious aggravation of the disorder.

Pyoktanin.—Pyoktanin,² or methyl blue, has been quite extensively employed by some in the treatment of carcinoma. The method adopted has been to inject a solution of the drug into the neoplasm. In no case, however, has it acted as a curative agent, though in some cases it is said to have relieved the pain. In the light of this experience it seems improbable that the observations of Maibaum will be confirmed. He describes 3 cases of advanced carcinoma of the stomach treated with pyoktanin. The drug was administered in grain doses three times a day in the form of a pill taken after meals or as a rectal suppository. In all cases the treatment was followed by marked improvement in the local and general condition of the patients. The dyspeptic symptoms subsided, the appetite returned, and the weight increased. Maibaum concludes that pyoktanin arrests the disintegration of the carcinomatous growth, and has a beneficial action on the general health of patients suffering from the carcinomatous cachexia.

Quinin.—The use of quinin in whooping cough is certainly not new, and it is one of a vast number of drugs tried thus and now little used. That it

¹ Int. Med. Ann., 1895.

² The Year-book of Treatment, 1895, from Meditzina, Nov. 7, 1894.

has a tonic action is undoubted, but that its action is anything more we consider questionable. Fischer¹ concludes from his experience with quinin in pertussis, however, that—1. It diminishes the number of attacks essentially in five days at latest. 2. It reduces even the most vehement whooping cough to a mild bronchitis in from twelve to fifteen days. 3. It influences not unfavorably a possibly existing bronchopneumonia. 4. It often stimulates the appetite. Fischer prescribes after Baron² 1 cgm. for the month, 1 dgm. for the year, of every patient, the highest single dose not exceeding 4 dgm. (6 $\frac{2}{3}$ gr.) three times a day.

Rubidium Iodid has been brought forward as a substitute for potassium iodid. Vogt³ states that the taste is not very pronounced, that it is much better borne than the ordinary iodids, and that those who cannot take the potassium salt suffer no inconvenience from the administration of this new product. It costs about three times as much as potassium iodid.

Sparteïn.—Cerna⁴ publishes an experimental study of the physiologic actions of sparteïn. The experiments were made particularly on dogs. The results are as follows: On the muscular system, after minute doses, there is a brief period of increased muscular irritability, which, however, soon disappears. No marked depression of normal irritability has been observed even under massive quantities of the drug. On the nervous system there is no direct proof, experimental or clinical, that this agent acts as a narcotic. Its influence is exerted particularly on the lower nervous system, and in moderate, especially small, doses causes an increase in the reflexes, and this increase is of centric origin. This stimulation of reflex activity is generally followed by a distinct depression. Sparteïn so stimulates the system as to cause convulsions, usually of a tetanic nature. This phenomenon is not the result of a peripheral action of the drug, but is spinal in origin. So also when death occurs the paralysis is the result mainly of its action on the cord itself. On the circulation, if the drug is introduced into mammals intravenously, there occurs at first a slight rise of the arterial pressure, accompanied with an increased action of the heart. In a short time both the rate of the pulse and the height of the blood-pressure fall below the normal standard, to return, if the dose is not pushed, to the original point. If the ingestion of the drug, however, be continued, the depression, with slight variations, is gradual until the occurrence of the death of the animal. A noticeable phenomenon is the enormous increase in the size of the individual pulse-waves accompanying the reduction of the frequency of the cardiac beat and the fall of the arterial pressure. Experiments upon the heart showed that the drug powerfully stimulates the cardiac muscle, and probably also the intracardiac ganglia. Finally, these become paralyzed and the organ is arrested either in systole or in diastole. It is thus seen that the actions of this drug upon both the arterial pressure and the rate of the pulse in normal animals are not by any means constant, the effects being

¹ N. Y. Med. Jour., May 11, 1895.

² Berlin. klin. Woch., No. 43, 1893.

³ Union méd., July 4, 1894.

⁴ Am. Jour. Med. Sci., Sept., 1894.

undoubtedly dependent not only on the size of the dose administered, but also upon which one of its actions predominates. The author¹ concludes, from his own experience and from a careful review of the literature on this subject that spartein is a cardiac and renal stimulant second only to digitalis. It is usually best given by itself. Jouillard observes that spartein and potassium iodid are incompatible. An important point is that of dosage. Cerna remarks that small doses generally lead to disappointment. He gives as high as $\frac{1}{2}$ gr. every three hours. In the judgment of Hare² spartein is not a very useful drug; it has entirely failed to be of service in his hands. [This opinion is entirely at variance with general experience; spartein is extensively used, and certainly in a large proportion of cases acts as an efficient cardiac and renal stimulant.]

Sulphonal.—As each year passes we are given additional evidence to prove that sulphonal is not quite as innocent a drug as we once thought it. Priestley³ sums up the conclusions at which he has arrived from the consideration of 13 cases in which hematoporphyrin was found in the urine: 1. It occurs both in health and in disease, and may persist for a long time without affecting the general health of the patient. 2. Its appearance is sometimes associated with extreme exhaustion, often fatal. In fatal cases the patients were all women of a neuropathic type. 3. While in many cases the symptoms developed spontaneously, or at least independently of any adequate cause, still in a remarkable majority of the cases the patients were taking sulphonal at the time the symptoms set in. Before connecting sulphonal with the development of the symptoms of hematoporphyrinuria Priestley thinks the following facts ought to be taken into consideration: (a) that, though men and women equally take sulphonal, it is only women who seem to suffer from the disorder; (b) the symptoms, too, have never been known to follow a genuine over-dose, but only in cases of moderate administration; (c) mere cessation of the administration of sulphonal does sometimes, but not generally, cause a discontinuance of the symptoms: the same may be said with regard to its readministration. Priestley, therefore, considers the argument connecting hematoporphyrinuria with the administration of sulphonal as inconclusive. Still, no doubt it has some effect in certain susceptible people. He therefore advises that when using the drug after a week's administration it should be dropped for half a week, and that the urine, especially in neuropathic cases, should be frequently tested spectroscopically for hematoporphyrin. Stern⁴ reports the case of a woman who had at first taken 15 gr. and afterward 30 gr. of sulphonal every evening for three months, with occasional intermissions. When the total amount taken reached 5 ounces, the urine became dark-colored, and fatal coma supervened in a week's time. A toxic nephritis with necrosis of the epithelium and hemorrhages in the kidneys was found. In kidney-

¹ N. Y. Med. Jour., May 26, 1894.

² Practical Therapeutics, 1894.

³ The Year-book of Treatment, 1895, from Med. Chron., Sept., 1894.

⁴ Ibid., from Deutsch. med. Woch., March 8, 1894.

disease sulphonal should be given with care, and in all cases of prolonged administration the urine should be carefully watched. Hirsch¹ reports a case of acute poisoning following a single dose of 25 g. of sulphonal, all of which, however, was not absorbed, as the patient vomited soon after taking it. When found the patient was unconscious and pulseless. The heart's action continued feeble for some days. Other symptoms were marked somnolence, lasting four days, anorexia, severe epigastric pain, and obstinate constipation for five days. On the fourth day kidney-symptoms developed and lasted three days—moderate albuminuria, the appearance of red and white cells and casts, a diminution in the amount of urine. There was no hematuria. The blood showed no increase in white cells; the number of red cells was normal, but the percentage of hemoglobin was lowered. There was analgesia of the lower extremities and some anesthesia. Nystagmus appeared on the fifth day; this phenomenon has not been previously observed. Recovery ultimately took place. In general, sulphonal is to be considered a good hypnotic and as one unattended with danger, provided its administration is interrupted from time to time. The usual symptoms of poisoning are prostration, vomiting, constipation, and the appearance of red urine (hematuria). The maximum dose for a man should be 30 gr. but for a woman it should not exceed 15.

Thymol.—Though its value in other parasitic diseases is certainly open to much doubt, against the ankylostoma thymol does often seem effective. Sorsino² says that this drug often acts like a charm in the treatment of ankylostomiasis, although in some rare cases he has had great difficulty in ridding the intestines of the parasite by means of this remedy. In a case of this kind observed by him daily doses of 60 gr. brought away in all 31 ankylostomata; nevertheless, the stools contained eggs of this parasite in as great numbers as they did before the thymol treatment was begun. The author cannot explain the cause of this, though he thinks that it may be due to the circumstance that a certain number of worms are so imbedded in the folds of the valvulæ-conniventes that the thymol cannot come into contact with them. Thymol is best given in wafers or cachets. As the result of observations on 400 cases of ankylostomiasis, Sandwith³ recommends thymol in the treatment of this condition. The dose should not exceed 4 g. administered in two equal quantities at an interval of two hours, and in weakly subjects it should be followed by some stimulant, such as brandy. A dose of castor oil should be given two hours after the second dose. A milk diet should be prescribed the day before and after the taking of the thymol.

Thymus Gland in the Treatment of Exophthalmic Goiter.—Owen⁴ publishes a case of exophthalmic goiter successfully treated by the accidental

¹ Therap. Monats., Jan., 1895.

² N. Y. Med. Jour., Jan. 5, 1895, from Lancet, Dec. 1, 1894.

³ The Year-book of Treatment, 1895, from Lancet, June 2, 1894.

⁴ Brit. Med. Jour., Feb. 16, 1895.

administration of the thymus gland. The subject has been still further investigated by Cunningham,¹ who reports in detail 3 cases of Basedow's disease so treated. In 2 of the cases a fresh thymus from a lamb that had been brought up on milk was administered daily. This was minced up finely and taken either raw or slightly cooked. In the third case thymus tabloids² were used at the rate of from 12 to 15 five-grain tabloids per day. Within from ten to fourteen days marked improvement was observed in all the cases. In the first case the pulse fell gradually from 124 per minute to 72; in the second case, from 110 to 76. In these 2 cases the exophthalmos gradually disappeared and the size of the thyroid became normal. The tremor and a distressing insomnia disappeared, and the general health improved. The third case was treated with the thymus tabloids. It is curious to note that under their influence the ocular symptoms improved rapidly, whereas the other symptoms improved much more slowly than was the case when the fresh thymus was taken. That the foregoing influence of the thymus gland on Basedow's disease is not an accidental one is evident from Owen's case, in which the symptoms disappeared during the administration of the gland to reappear when the treatment was discontinued. Cunningham states that thymus seems to exert no influence on ordinary hypertrophy of the thyroid. [No satisfactory explanation of the influence that thymus-feeding seems to have upon exophthalmic goiter has as yet been offered. It certainly is remarkable that a gland, the functional activity of which is greatest in early life, and which is usually completely atrophied when puberty is attained, should when introduced into the system exert so powerful an influence on this disease. Though the number of cases reported is still too small to enable us to say to what extent this treatment will prove useful in exophthalmic goiter, whether it will relieve the symptoms in all cases or only in some, it is certainly desirable that the administration of thymus should be tried in all cases of this disease. The ingestion of the thymus, we have been told by Dr. Cunningham, is unattended by any of the toxic symptoms that may follow the administration of other glands, such as the thyroid and the pancreas.]

Properties of the Thyroid and Spleen.—Gourlay³ concludes, from his experiments: 1. The thyroid does not contain nor yield any peptone or proteose. 2. Its secretion is not mucin, as it yields no reducing sugar on treatment with dilute mineral acid. 3. The only proteid obtainable in any quantity from it is a nuclealbumin. 4. This proteid is derived, at any rate partly, from the so-called "colloid matter" in the acini. 5. Experiments that had for their object the finding in the thyroid of a ferment that dissolves mucin led to negative results, and the writer suggests, with all reserve, that the nuclealbumin is the material to which the thyroid treatment of myxedema owes its usefulness. 6. Thyroid nuclealbumin causes intravascular coagulation. As regards the spleen Gourlay finds that: 1.

¹ Med. Record, June 15, 1895.

² Of Messrs. Burroughs, Wellcome & Co.

³ Am. Jour. Med. Sci., July, 1895, from Jour. of Phys., Nos. 1 and 2, 1894.

The spleen, like the thyroid, is alkaline. 2. Fresh spleen contains neither peptone nor proteose. 3. The proteids that can be extracted from fresh spleen resemble those found in lymphoid structures. 4. The most important of these proteids are a globulin and a nuclealbumin. 5. The nuclealbumin, like that similarly obtained from other cellular organs, when injected into the circulation of rabbits, produces intravascular coagulation.

Trional.—Khmelewsky,¹ a Russian physician who has studied its action in lunatics, in neurasthenics, and in healthy persons suffering from insomnia, states that the hypnotic effect of trional varies according to the class of patients. In those who have no psychic disorder a dose of from 22 to 30 gr. is sufficient to produce a quiet sleep; this dose gives rise immediately after its administration, and when the patient awakes, to the same troubles that sulphonal does, but it never causes circulatory, respiratory, or digestive disturbances, although in some cases its employment has been prolonged for a year. In this respect it has a real advantage over sulphonal. In lunatics suffering from insomnia and in those with chronic psychic disorders it acts better; in all other cases, however, it acts slowly, often not until the following night. It always quiets maniacal excitement and alcoholic delirium, but it has a very bad effect in melancholia and in hypochondriasis, as it increases the nervous depression. It must not be given even in cases of cerebral neurasthenia, as it accentuates the atony and the depression. Although trional is eliminated more quickly than sulphonal, it may become accumulated in the organism and may cause serious trouble. To avoid any possibility of this occurring, Khmelewsky prescribes it at intervals of two days, and gives not more than 30 gr. a day. In delirium tremens it may be given even in larger doses. Rychlinski,² from observation on 100 cases of insomnia in neurotic and insane subjects, concludes that in doses varying from 0.4 to 0.5 g. trional is a most valuable hypnotic, especially in functional derangements of the nervous system. It is without influence on the heart, has no bad taste, and is easily soluble in hot tea or milk. In his hands no disagreeable symptoms attended its use. [This observation, unfortunately, is not confirmed by others who have studied the drug.] In order to prevent certain by-effects, some of which have already been mentioned, Goldmann³ suggests the following rules: The dose should never exceed 2 g. A dose of 1.5 g., he says, will usually produce within from fifteen to thirty minutes a sleep lasting from six to eight hours. Trional should never be administered dry or in a small quantity of cold water, but in at least 6 ounces of some warm fluid, as tea or soup. This favors quick absorption and prompt action. The use of the drug should be interrupted from time to time. In order to prevent possible accumulation of the unabsorbed drug, and to avoid grave accidents from destruction of the blood-corpuscles, it is necessary to increase the alkalinity of the blood by the use of seltzer or Apollinaris water or of the organic acids, as citric or tartaric. If, in spite

¹ N. Y. Med. Jour., April 20, 1895, from *Presse méd.*, March 23, 1895.

² *Therap. Gaz.*, July 16, 1894.

³ *Therap. Monats.*, Nov., 1894.

of these precautions, constipation occurs, a Seidlitz powder or some similar laxative must be employed. Vogt¹ makes similar observations. Claus² makes a report of his experience with trional as a hypnotic for children. Given in doses of from 3 to 22½ gr., according to the age of the child, he has found this drug a reliable hypnotic, producing a physiologic sleep and leaving no headache or heaviness on the following morning. The patient does not become accustomed to its effects. Sleep is usually produced from ten to fifteen minutes after ingestion. In painful conditions its influence is not very satisfactory. In one instance, in a case of bronchopneumonia in a child of five years, a single dose of 11 gr. produced ataxic symptoms. The best results were obtained in cases of chorea and pavor nocturnus and in insomnia from disturbances of dentition or of digestion. In several cases of the latter class the influence of the drug upon the digestive functions seemed beneficial. This agrees with previous experience in the use of trional among the insane. The dose from one month to one year of age is from 3 to 6 gr.; from one to two years, from 6 to 12 gr.; from two to six years, 12 to 18 gr.; and from six to ten years, 18 to 22½ gr. It is best given half an hour after the evening meal or fifteen minutes before bedtime. It can be given in hot milk, in confection, or in honey.

Ammonium Salicylate.—Wood³ speaks strongly in favor of ammonium salicylate in the treatment of rheumatic affections. The salt is freely soluble, is rapidly absorbed, and, when given in sufficient amount, quickly produces the symptoms that mark the salicylic action. It is best given in milk, and is usually well borne. As it is much less depressing in its action than the other salts of salicylic acid, Wood considers it the best method of administering the salicylates for ordinary purposes.

Betol is a salicylate of betanaphthol, and occurs as a crystalline colorless powder without odor or taste. It is not decomposed in the stomach, but in the intestine is broken up into its constituent parts. Fedora and Corselli,⁴ found that if 1 g. of betol was given to a healthy person, salicyluric acid appeared in the urine in the course of seventy to eighty minutes. In a case of carcinoma with dilatation of the stomach the first traces of the acid were discovered only after three and a third hours. The writers suggest that this drug may be advantageously employed for determining the motor power of the stomach.

[It does not appear that betol possesses any advantages over salol, which was long ago recommended by Ewald and Sievers as a means of determining the motor power of the stomach. This method, though often of use, is unfortunately not entirely reliable, owing to variations in the composition of the contents of the duodenum and jejunum.]

A New Antidote for Cyanide-poisoning.—Although the cyanides are

¹ Practitioner, Jan., 1895.

² Am. Jour. Med. Sci., April, 1895, from Intern. klin. Rundschau, No. 45, 1894.

³ Univ. Med. Mag., Jan., 1895.

⁴ Int. Med. Mag., Sept., 1894, from Revue des Sci. méd., July 15, 1894.

the strongest of poisons, Antal¹ observes that the rapid form of death only occurs in a small proportion of cases of poisoning by them. Potassium permanganate, according to Kossa, is capable of neutralizing the poison in the stomach before it has been absorbed, but after its absorption this antidote is useless. Antal claims that in cobaltum nitricum oxydulatum he has discovered an antidote that will render the poison inert in the stomach, and at the same time will neutralize the effect of the absorbed drug. In the stomach this cobalt salt forms with the cyanide a harmless compound, potassic cobaltcyanide (K_3CoCy_6). The fact that the cobalt salt can render absorbed cyanide inert is due to the rapidity of its absorption and to the small quantity needed to make a large quantity of cyanide harmless. Little is known of the physiologic action of cobalt salts, but the employment of this cobalt in $\frac{1}{2}$ to 1 per cent. solution appears harmless. Antal's experiments were made on dogs and rabbits. In case of poisoning in man he suggests that from 10 to 30 c.cm. of the foregoing solution should be injected subcutaneously, and at the same time some of the solution should be given by the mouth.

Gallobromol.—Gallobromol, or dibromogallic acid, is gallic acid in which 2 atoms of hydrogen have been replaced by 2 atoms of bromin. It occurs in fine white needles, freely soluble in hot water, alcohol, and ether; less so in cold water. As the solution in ordinary water undergoes some change and turns to a reddish color, distilled water should be used to dissolve it. Lépine² of Lyons has lately studied its action in the treatment of epilepsy, and has found it to be an excellent substitute for the alkaline bromids, and that it is well borne by the patients even in large doses. As much as from 10 to 15 g. may be given daily without producing ill effects. Cerna³ states that it not infrequently causes a feeling of heaviness, and even of pain, in the epigastrium.

Iodic Acid; Sodium Iodate.—These are white, odorless, crystalline substances, freely soluble in water, insoluble in ether, alcohol, and glycerol. Numerous experiments conducted by Ruhemann⁴ have convinced him that both these preparations have an extensive therapeutic value. Whilst the acid is physiologically very active, the sodium iodate is much milder, and may be employed whenever irritation is undesirable. When the salt is used for external application it should be finely pulverized, in order that it may come in as close contact as possible with all parts of the wounded surface. If it is used undiluted, it should be applied only to the ulcerated part, as it is more or less irritating to the healthy skin. If desired, it may be attenuated with powdered boric acid 1 : 2 or 1 : 4. The author has used the salt in pure form in diseases of the nose and of the larynx; the acid he uses in watery solution or mixed in lanolin-ointment in the strength of 10 per cent. He finds it of special benefit in chronic rhinitis. Internally he recommends

¹ Brit. Med. Jour., March 16, 1895, from *Physiol. Studien aus d. Univ. Budapest*, 1895.

² Univ. Med. Jour., Jan., 1895, from *Jour. de Pharmacie et de Chimie*, Nov., 1894.

³ Cerna: Notes on the Newer Remedies. ⁴ Therap. Monats., March and April, 1894.

it in serofulous affections and in enlarged glands. He has had excellent results from its continued use in bronchial asthma. It is well borne by children and does not produce digestive disturbances. The daily dose is 1 g., and is best given in pill form *t. d.* If applied to a bleeding surface, a 10 per cent. solution of the acid will promptly check the hemorrhage. It is said to yield better results in the treatment of chancre and chancroids than does iodoform.

Injection of a Glycerol Extract of the Kidney-substance in Albuminuria.—Some interesting investigations have recently been made by Teisser and Fränkel,¹ at the request of the late Prof. Brown-Séquard, to determine the influence of the kidney-extract on the chief organic functions, and particularly on the excretion of toxic bodies in the urine. The experiments were carried out with an extract prepared from the sheep's kidney by carefully triturating it and macerating it for twenty-four hours in a 10 per cent. mixture of glycerol and water. When injected subcutaneously or into the veins of an animal, 20 c.cm. of this solution per kilogram of body-weight occasioned no unpleasant results. An injection of five times the quantity, on the contrary, caused death with intense dyspnea, nystagmus, and convulsions. In their clinical experiments the authors injected at first only 2 c.cm. a day, and afterward the same quantity twice a day. Two patients were selected: one was affected with typical interstitial nephritis, with edema, cardiac disturbances, and general troubles connected with renal insufficiency; the other presented symptomatic albuminuria. For three days the patients were put on a strict milk diet. During this time the urine was carefully tested, its toxicity was established according to Bouchard's method, the density of the blood was determined, and the red and white corpuscles estimated. In this way each patient's nutritive condition was determined. This method of observation was also pursued for five days while the subcutaneous injection of the extract was carried out, and then for three days during which no extract was given. There was no change in the amount of urine passed; there was no modification of the density of the blood nor of its corpuscular composition. The arterial tension was slightly increased. In the case of interstitial nephritis a slight increase of urea was noticed and a marked increase of the phosphates, and also an augmentation of the coefficient of urotoxicity. The most interesting fact noted was the property of producing myosis possessed by the urine passed on and after the second day of the injections when used in quantities of only 60 c.cm.; while during the preparatory period this phenomenon, which is to some extent an index of the toxicity of the urine, was not produced or scarcely marked with 340 c.cm. In the second case the urea was considerably increased, but no change was observed in the amount of the phosphates excreted. The interesting feature noted was the disappearance of the albumin during the days on which the injections were given, in spite of a higher temperature, and its reappearance after the injections were discontinued. The urotoxic coefficient was in-

¹ Practitioner, Sept., 1894, from *Lyon médical*, No. 17, 1894.

creased. Although the elevation of the urotoxic coefficient is in part due to the elimination of the substance injected, the amount of the extract used is so small that the authors conclude that the injections really augment the kidney's power of eliminating toxic substances. A feeling of general relief and amelioration is said to have been experienced by the patients during the use of the injections. As a result of their investigations the authors believe that injections of kidney-extract may be used with advantage in the treatment of nephritis.

The Effect of Mercury on the Kidneys.—The urine in 97 cases of syphilis was examined by Welander¹ both before treatment with mercury was begun and during its administration, who found that the elimination of the drug was attended with the appearance of casts in the urine. The number of casts increased in proportion to the length of the treatment, but after its cessation gradually decreased, and within four or six weeks had entirely disappeared. He states that no injury to the kidneys either temporary or permanent was observed.

Neurodin.—Neurodin is chemically acetyl-paraoxyphenyl-urethane. It occurs in odorless and colorless crystals, soluble in boiling water in the proportion of 1 to 140 parts. The drug was originally introduced by von Mering in 1893. Lippi² has recently experimented with it, and draws the following conclusions: Doses of from $\frac{1}{2}$ to 3 g. are well borne, are effective, and may be repeated several times a day. The only disagreeable effect following these doses was occasionally a diarrhea, with or without intestinal pain. In rare cases there was a slight diminution in the rapidity of the heart-beats. As regards the analgesic action of the drug, it was found to have the property of relieving pain, whether neuralgic in character or symptomatic of an organic lesion; its action is, however, uncertain, and is certainly very inferior to that of phenacetin.

Orexin Hydrochlorate.—Orexin, a derivative of chinolin, is a grayish, odorless powder with a bitter and pungent taste. It is soluble in water and in alcohol. Recently, Battistini³ has carried out a series of experiments to determine the value of this substance. Of 25 cases in which it was tried, there was no improvement of the appetite in 6, slight increase in 13, and a marked increase in 6. In artificial digestion orexin in 1 per cent. solution excited no influence on peptonization. The best results were obtained with doses of from 0.16 to 0.20 g., given two hours before meals. Larger doses may cause vomiting, vertigo, and other toxic symptoms. The results obtained are far from encouraging. On the other hand, Henzoldt⁴ claims that he has observed after the administration of orexin a marked improvement in the appetite to occur in as many as 27 out of 37 cases. He recommends the basic form, and gives it in doses of 5 gr. in milk or in bouillon,

¹ Univ. Med. Jour., Aug., 1894, from Hygien, 1894.

² Univ. Med. Mag., June, 1895, from Il Policlinico, Feb. 15, 1895.

³ Therap. Monats., Dec., 1894.

⁴ Canadian Pract., Aug., 1894.

and states that the effects are not to be expected until the drug has been continued for four or five days.

Papain is the name given to a digestive ferment derived from the juice of *Carica Papaya*. Hirsch¹ has made a very careful laboratory study of this remedy. In cases in which pepsin-digestion is more or less feeble he finds that papain, though not a complete substitute for pepsin, greatly promotes the peptonization of easily-digestible albuminous substances, such as raw eggs, milk, and raw meat. Its action on coagulated albumin is much less energetic. This action takes place equally well in an acid, alkaline, or even in a neutral medium. The author recommends its use especially in cases when there is absence of hydrochloric acid in the gastric secretions. From 0.25 to 0.5 g. should be administered in the smallest possible quantity of water or in pill directly after the meal, and should be repeated two or three times at intervals of from fifteen to thirty minutes. In order to obtain good results the diet must be carefully regulated.

[Though valuable in the condition of gastric subacidity, papain must certainly be regarded as a palliative agent only, and its administration cannot be considered rational if unaccompanied by other corrective agents, notably hydrochloric acid and systemic remedies.]

Piperazin.—In order to find out whether piperazin, in passing through the body, forms with uric acid a substance easily soluble in the urine, Bohland² experimented with a case of leukemia in which the urine showed a persistent uric-acid sediment. Even after large doses had been taken and continued for a long time absolutely no change in the amount of uric acid excreted could be detected. Similar observations have been made by Schmidt, Bresenthal, and Levison on healthy individuals. The latter, during the use of piperazin in a case of gout, observed no increase of uric acid excreted in the urine. The conclusion of these experimenters is that the drug is useless as a solvent of uric-acid concretions, the enlargement of which cannot be checked by its use.

The following is a summary of a paper by Sharp³ on this remedy: 1. Piperazin is not wholly oxidized in the body, and may be detected in the urine of those to whom it is exhibited. 2. Solutions of 1 per cent. in normal urine, when kept in contact at a temperature of 39° C. for a given time, have the property of dissolving to a great extent a fragment of uric-acid calculus. 3. The stronger the solution of piperazin in the urine, the earlier did the solvent action begin, though the rate of solubility was not so markedly rapid over the weaker solution as might be expected. 4. The solvent action of piperazin was greater than other substances similarly employed—borax, lithium citrate, sodium carbonate, potassium citrate. 5. Piperazin in weak and strong solutions converted the undissolved portion of the calculus into a soft granular or pulpy condition.

In connection with the deductions of Sharp, some experiments made by

¹ Therap. Monats., Dec., 1894.

² Ibid., May, 1894.

³ Therap. Gaz., Sept. 13, 1894, from Brit. Med. Jour., June 16, 1894.

Fawcett¹ with piperazin are instructive, for, while they admit the solvent action of piperazin on uric acid in the laboratory, they confirm the generally accepted opinion that its employment clinically as an uric-acid solvent is useless. Although Sharp demonstrates that when 2.0 g. of piperazin are taken daily, only 0.3 g. of unoxidized piperazin is excreted, giving a solution of the drug in the urine of about 0.02 per cent., yet the strength of the solutions with which he experimented varied from 2 to 7.5 per cent. [As solutions of this strength cannot be obtained by the administration of the drug clinically, and as Fawcett proves that a solution of piperazin in urine of a strength of 1 : 1000 is inert, it would seem that there are no longer any indications for its further use in medicine.]

Potassium Bromid.—It would seem from the experience of Greenless² that the administration of the bromids is sometimes attended with very serious results. He reports several cases of poisoning from the use of potassium bromid. In 1 case, that of an epileptic who had taken 75 grains a day for three weeks, coma developed and death soon followed. The autopsy showed merely congestion of the meninges. In another epileptic the same dose, continued for ten days, resulted in coma and death. In this case the brain and meninges were found congested, and the kidneys showed advanced interstitial changes. In certain cases of intoxication the author states that large doses of bromids produce stupor and prostration which is only slowly recovered from. [Although coma may undoubtedly result from the use of large doses of a bromid, a case having occurred to our own knowledge, acute bromid-poisoning is certainly an unusual occurrence.]

Potassium Permanganate as an Antidote to Vegetable Poisons.—Moor³ has proposed potassium permanganate as a chemic antidote for morphin. He states that if 1 grain of morphin sulphate be dissolved in a solution of 250 grains of white of egg and an ounce of water, and 1 grain of potassium permanganate dissolved in 1 ounce of water be added, the morphin will be immediately destroyed without the albumin being interfered with. In proof of the antidotal value of the permanganate, Moor took semipublicly 3 grains of morphin, followed immediately by the permanganate. No narcotic effects were produced.

To test the antidotal value of the permanganate, Wood⁴ made two series of experiments: 1. Those in which the permanganate solution was added to the alkaloidal solution outside the body, the precipitate removed, and the filtrate given either by the mouth or hypodermically. 2. Those in which the two agents were given separately by the mouth. The result of the experiments seems to show that the filtrate from the mixed solution of potassium permanganate and morphin sulphate is almost, but not entirely, devoid of poisonous properties. Three experiments were made on pigeons. Twice the ordinary dose of the morphin-solution failed to produce any

¹ Brit. Med. Jour.

² Canadian Pract., May, 1894, from Quart. Jour. of Inebriety, vol. xvi. No. 1.

³ N. Y. Med. Jour., Feb. 17, 1894.

⁴ Univ. Med. Mag., Aug., 1894.

symptoms; in the third case, after an enormous dose of the filtrate, the bird died, but the symptoms were not those of morphin-poisoning. Wood next attempted a series of experiments upon dogs and rabbits with morphin given by the mouth, but found the results, especially in the case of the dogs, very unsatisfactory, as in a number of control-experiments the morphin failed to kill. In the case of a rabbit a dose of morphin sufficient to produce persistent tetanus in the control-animal, which was followed in six minutes with 10 c.cm. of a 4 per cent. solution of potassium permanganate, failed to produce any evidence of poisoning. As very large doses of morphin are recovered from by the animal when the alkaloid is given by the mouth, it is evident that these experiments are not conclusive. In this connection Wood quotes some chemic studies made by Prof. Wormley: 250 mg. of morphin sulphate were dissolved in 25 c.cm. of water containing 500 mg. of potassium permanganate. The solution was maintained at a temperature of 100° C. for ten minutes. The mixture was then treated with a slight excess of ammonia and extracted with amylic alcohol. The extract showed traces of morphin.

Schlagdenhauffen and Reeb claim that the permanganate has the power when given hypodermically of being absorbed, and of acting on the poison that has previously been taken into the blood. The avidity with which the permanganate attacks all kinds of organic matter, living or dead, speaks strongly against this statement. Experiments performed on cats, rabbits, and pigeons make it highly improbable that the permanganate has any influence upon the poison after its absorption. Wood concludes that the present evidence indicates that potassium permanganate given by the mouth directly after the poisoning is a valuable, but not a perfect, antidote. Although the journals contain from time to time reports of cases¹ of opium-poisoning treated successfully by the administration of this drug, both by the mouth and hypodermically, yet the investigations of Wood and Wormley show that the antidotal value of potassium permanganate is by no means so great as has been claimed.

Similar experiments undertaken by Wood to determine the antidotal value of this substance to strychnin demonstrate that the permanganate has the power of destroying the alkaloid, but do not demonstrate that its action is sufficiently prompt and decisive to be of value.

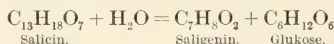
Salacetol.—Salacetol is obtained from the interaction of sodium salicylate and monochloroacetone. Bourget² advocates the use of this drug in the treatment of summer diarrhea and choleraic diarrhea. It is best given in castor oil and on an empty stomach. It is said that usually a second administration of the remedy is not necessary. This drug is particularly adapted for use in children, as it has been found to be much less poisonous than salol. The dose is from 30 to 45 gr., administered alone

¹ N. Am. Pract., Sept., 1894, and N. Y. Med. Jour., May 25, 1895.

² The Year-book of Treatment, 1895, from Correspond. Blatt. f. Schweizer Aerzte, No. 14. See Cerna: Notes on the Newer Remedies.

or in combination with castor oil. For children as much as $7\frac{1}{2}$ gr. may be given daily.

Saligenin is a derivative of salicin. Under the action of a ferment like emulsin salicin is split up into glucose and saligenin :



Saligenin is also made synthetically from phenol and formaldehyd. It is a colorless, crystalline substance, slightly soluble in cold water, freely soluble in hot water and in alcohol, and has a slightly bitter taste. Marme¹ has demonstrated that salicin is converted in the upper part of the small intestine into saligenin and glucose, and through oxidization is further changed into salicylaldehyd and salicylic acid. Lederer attributes the activity of salicin to saligenin, and as salicin contains only 43 per cent. of the latter, he proposes saligenin as a substitute for salicin. He reports 7 cases of acute rheumatism and 1 of acute gout in which saligenin was used. The pain and swelling were promptly relieved and no by-effects were observed. It is given in powder or in weak alcoholic solution in doses of 0.5 to 1.0 g. every hour or two.

Salol.—Josias² reports an instance in which the administration of 15 gr. of salol, followed on the next day by 30 gr., gave rise to a scarlatini-form erythema, with spots resembling measles and red papules. Phenic and salicylic acids were present in the urine. Dujardin-Beaumetz believed that one cause for these symptoms was to be found in the renal impermeability which is set up by the ingestion of aromatics like phenol. Bardet has found that in febrile conditions chilly sensations, cyanosis, and rashes not infrequently follow the use of aromatics, while in nonfebrile states accidents do not occur, even if the doses are large.

A new test for salol is the following: If a few drops of nitrosulphuric acid are added to a small quantity of salol in a china dish, the mixture will first turn yellow, soon changing to brown, and finally to green. By adding water and stirring it becomes reddish, but the green color returns on the addition of ammonia. Resorcin similarly treated takes on a beautiful dark-blue tinge, which water changes to red, but which is restored by ammonia.³

Saluminum.—This name is given to two compounds of alumina with salicylic acid. One is almost insoluble in water, and is called aluminum salicylicum; the other, which is soluble in 9 parts of water, is aluminum salicylicum ammoniatum. The solution gives a neutral reaction. Both have been used clinically by Heymann⁴ of Berlin with good results. They are highly astringent, and are especially valuable in affections of the mouth

¹ Therap. Monats., Jan., April, 1895, from Münch. med. Woch., 1894, p. 619, and 1895, No. 7.

² Am. Jour. Med. Sci., June, 1894, from Jour. des Praticiens, No. 23, 1894.

³ Atlanta Med. and Surg. Jour., Nov., 1894, from Pharmaceutische Zeitsch. für Russland.

⁴ Internat. Med. Annual, 1895, from Lancet, Aug. 8, 1894.

and nose. Insufflation of the insoluble, or, better still, of the soluble saluminum, is serviceable in the treatment of ozena. In catarrh of the mouth 20 parts of the ammoniated salt in 30 parts of water and 50 parts of glycerol serve as excellent applications.

Scopolamine is an alkaloid derived from *Scopolia atropoides*. Harvey Smith¹ considers that the greatest value of the drug as a mydriatic lies in the rapidity of its action. Complete and thorough paralysis of accommodation with maximum mydriasis can be produced within thirty minutes when the drug is used "coup sur coup." The duration of its effect is from five to eight days. One-tenth and one-fifth per cent. solutions easily produce toxic symptoms, unless at the time of instillation the lids be averted or the nasal ducts be compressed.

Sodium Benzoate.—Attention is again called by Liegos² to the value of sodium benzoate in the treatment of acute inflammations of the upper air-passages—pharyngitis, laryngitis, and bronchitis. Under its use the symptoms are said to subside in a few days. The daily dose for a child is 75 gr.; for an adult, from 150 to 225 gr.³

Sodium Chlorate.—Brissaud⁴ states that he has obtained astounding results from the use of this salt in cases of carcinoma of the stomach. He reports a number of cases presenting classical symptoms, including a tumor in the epigastric region, which were so treated. After sodium chlorate in daily doses of from 12 to 16 g. had been administered for a period of six weeks he reports that the hemorrhages ceased, the cachexia disappeared, and the tumor could no longer be felt. The author claims that this treatment is especially valuable in the epitheliomatous forms, in which there are no metastases and no complications of the nature of thrombosis or phlebitis. The sodium salt is much less poisonous than the potassium salt, and is readily eliminated. He gives the drug mixed with 100 g. of water in teaspoonful doses. The only contraindication to its use is the presence of albuminuria even to a slight extent. More than 16 g. should never be given in twenty-four hours. Brissaud suggests that this salt may with advantage be substituted for the potassium chlorate in the treatment of stomatitis, etc.

[It need not be said that a remedy that will do what Brissaud claims for sodium chlorate is much to be desired. Similar claims have, however, been made in the past for condurango and for Chian turpentine, but these have not been supported by experience. Skepticism as to the value of sodium chlorate in gastric carcinoma would therefore seem unavoidable, at least for the present.]

Sodium Monosulphate.—Peyson⁵ has made some interesting experiments with this substance. He administered 30 cg. of white lead to two

¹ N. Y. Med. Jour., July 21, 1894. See also Therap. Monats., No. 3, 1894.

² Univ. Med. Mag., Aug., 1894, from Deutsche med. Woch., No. 10, 1894.

³ Am. Jour. Med. Sci., Dec., 1893.

⁴ Internat. Med. Annual, 1895, from Gaz. méd. de Strasbourg, May, 1894.

⁵ Ibid., from Jour. de Méd. de Paris, vol. i., and Practitioner, Aug., 1894.

dogs every day for twenty-three days, and then 1 g. daily for fifteen days, with the result that the urine contained only traces of the lead. To one dog, that was thus made extremely ill, he gave 1 g. of sodium monosulphate a day, with the result that recovery followed in eight days. Both dogs were then killed. Analysis of the liver of the dog treated with the monosulphate of sodium showed only traces of lead, while the liver of the untreated dog contained large amounts of lead.

Sodium Nitrite.—Gordon Sharp¹ draws the following conclusions from his experience with sodium nitrite: It is more stable than amyl nitrite and ethyl nitrite; it dilates the arterioles rapidly; disagreeable symptoms may be overcome by combining it with ammonia, spirits of chloroform, and small doses of morphin; it is most useful in anginal affections and in irregular heart-action; it should be continued for some time after all symptoms have passed away. The maximum dose is 5 gr.; generally 1 or 2 gr. are enough. It is useless in bronchitis, asthma, and in Graves' disease.

Somnal.—This is an ethylated compound of chloral and urethan. De Montyel² has obtained excellent results from its use in patients affected with acute melancholia. Not only has it produced sleep, but even recovery after from three to four weeks of its daily employment in doses of from 75 to 105 gr. In other subjects somnal provokes a certain degree of intoxication before sleep, agreeable dreams during sleep, and a slight excitation and gayety on awakening. Khmelewsky confirms these observations, though he has not noted any particular gayety or excitement in the patient on awakening. He says that in melancholia and in simple insomnia somnal acts better than any other hypnotic, for not only does it induce an agreeable and profound sleep, but it is not accompanied by disagreeable subjective symptoms on awakening; it causes no depression, as sulphonal and trional do; it does not give rise to the motor troubles that so frequently follow the use of chloralose; it never produces cardiopulmonary accidents. The only contraindication to its use is in gastrointestinal disorders, as it may aggravate dyspepsia and diarrhea.

Sphacelotoxin is an alkaloid derived by Jacobi³ of Strassburg from ergot. It is a yellow powder, insoluble in water, but soluble in alcohol and in chloroform. Freund of Strassburg employs it as a substitute for ergot in his obstetric cases. The dose varies from 0.04 to 0.10 g. It is given hypodermically, dissolved in glycerol and alcohol. It is nonirritating. The action begins in a few minutes, and attains its maximum intensity in half an hour.

Spasmotin is a poisonous element of ergot recently isolated by Jacobi of Strassburg.⁴ It has been so named on account of its causing spasms of the small arteries. It has, like ergot, a stimulating effect on the pregnant uterus.

¹ Practitioner, May, 1894.

² N. Y. Med. Jour., April 20, 1895, from *Presse méd.*, Mar. 23, 1895.

³ Dublin Jour. Med. Sci., Jan., 1895, from *Semaine méd.*, No. 11.

⁴ Am. Med.-Surg. Bull., June 15, 1894, from *Bull. of Pharmacy*, May, 1894.

The method of producing spasmodin is based on its solubility in ether and its insolubility in petroleum ether. Spasmodin is extracted from ergot direct by ether and precipitated by addition of petroleum ether, or the oil contained in ergot is first removed by extraction and the spasmodin extracted by ether from the ergot. By either method spasmodin is obtained in a pure state. It is described as a yellow amorphous powder, insoluble in water, in dilute acids, and in petroleum ether, but very easily soluble in ether, alcohol, acetic ether, and benzine. Spasmodin forms salts with alkalies. The pharmacological effects of ergot are inherent in spasmodin and in its sodium salt. The latter is not irritating and may be used hypodermically. Dr. Freund has used it with satisfactory results in doses ranging from 0.04 to 0.08 g. As much as 1 g. has been given without inconvenience.

Squill, Compound Syrup of.—It is the practice of many pharmacists to make compound syrup of squill from the compound fluid extract. In making the syrup in this manner it becomes turbid on the addition of the solution of tartar emetic in the amount of hot water ordered by the pharmacopeia. This may be largely if not completely overcome, according to Etel,¹ by making the solution of tartar emetic as ordered and adding 3 fluidounces of glycerol to the same for every pint of syrup wanted.

Strychnin, Antidote to.—Grigorescu² finds that butyl-chloral opposes the toxic action of strychnin. He states that if injections of strychnin were made in frogs that had received butyl-chloral, the animals would remain torpid. After some hours, however, the butyl-chloral would be eliminated and the animals would present all the typical signs of strychnin-poisoning. If the frog was kept under the influence of the antidote until all the strychnin was eliminated, complete recovery resulted.

Strontium Lactate.—Twelve cases of nephritis treated with this salt are reported by Reid,³ who observes that a prompt diuresis usually followed its administration, most pronounced in cases attended with edema. In many cases it was noted that the albuminuria was lessened. In one patient the albumin fell in seventeen days from 8 per cent. to 1.5 per cent. Like other drugs of the same class, it fails in individual cases. On account of its diuretic property it is to be recommended in pleurisy with effusion as a temporary substitute for sodium salicylate when the latter is not well borne. Strontium lactate possesses no toxic properties whatsoever. It is best given in solution. Of a solution, consisting of 25.0 in 150.0 g. of water the author prescribes from 3 to 4 tablespoonfuls daily.

Strontium salicylate is a coarsely crystalline powder, soluble in 31.25 parts of cold water, but by means of heat a permanent 6 per cent. solution can be made. In the proportion of its salicylic acid it compares with the sodium salicylate as 1.4 does to 1. When given intravenously, in fatal doses, to the dog, it produces death through paralysis of respiration, followed

¹ Atlanta Med. and Surg. Jour., Aug., 1894, from Western Druggist.

² Am. Jour. Med. Sci., Aug., 1894, from Archives de Physiologie, No. 1, 1894.

³ Therap. Monats., Jan., 1895, from Wien. klin. Woch., Nos. 16 and 17, 1894.

almost at once by an extraordinary postmortem rigidity. In some instances there is vomiting, but never purging. In doses of from 5 to 10 gr. after meals it often improves digestion. As an intestinal antiseptic the author considers it superior to salol and naphthol. He has frequently given as much as 120 gr. a day. Cerebral disturbance is not so readily produced as by the other salicylates. In muscular and subacute rheumatism, as well as in chronic gouty conditions with tendency to digestive disturbances, Wood¹ regards it as a very valuable remedy. He has not tried it in acute rheumatism. It may be given in solution or in capsules.

Sulphanilic acid is strongly recommended by Valentin² of Berne as a palliative in the treatment of acute rhinitis, laryngitis, and otitis media. From 2 to 4 g. of the acid are administered daily. It is best given in the following neutralized solution:

R̄. Pure sulphanilic acid,	10.0
Sodium bicarbonate,	8.0
Distilled water,	200.0—M.
Dose, 40 to 80 g. daily in 1 or 2 doses.	

In acute coryza within two hours the symptoms very considerably decrease or even disappear altogether. In aural catarrh there is the same amelioration. Relief lasts, however, only from twenty-four to forty-eight hours after a single dose, and, therefore, to prevent a recurrence of the symptoms, the remedy must be continued for several days. No unpleasant effects are produced. The "natrium sulfanilicum neutrale" of Merck may be used. It is cheap, and is much purer than the ordinary saturated solution.

Tannigen, or acetyltannin, a derivative of tannic acid, is described by Meyer³ as a yellowish-gray, slightly hygroscopic powder, without taste or smell. On animals it produces no change in the appetite, but checks intestinal secretions and causes constipation. It is to be detected in the feces even after small doses have been taken. Muller⁴ has used it with considerable benefit in chronic diarrhea. As a rule, 0.2 to 0.5 g. *t. d.* sufficed, but as much as 3.0 to 4.0 g. can be given without causing ill effects. In most cases improvement sets in promptly; in cases of pulmonary tuberculosis the diarrhea would return as soon as medication was stopped. Its value in acute diarrhea is doubtful. It can be taken for weeks without producing gastric disturbances.

[Personal experience with tannigen in the treatment of diarrhea occurring in advanced cases of pulmonary tuberculosis leads us to regard it as a very serviceable remedy in the milder forms of diarrhea, but in the severe forms, even when given in large doses, it has failed to lessen the intestinal discharges.]

¹ Univ. Med. Mag., Jan., 1895.

² Internat. Med. Ann., 1895, from Correspondenz-Blatt f. Schweizer Aerzte, April 1, 1894.

³ Deutsch. med. Woch., Aug. 2, 1894.

⁴ Ibid.

Tar, Compound Tincture of Coal.—Duhring and Baer have made a series of investigations with a view of obtaining the most desirable and elegant pharmaceutic and therapeutic preparation for external use. They conclude: 1. The best tincture of coal-tar is made with the aid of quillaia. 2. The strength of the tincture of quillaia should be 1 : 4 with 95 per cent. alcohol. 3. The coal-tar (1 part) should be digested with the tincture of quillaia (6 parts) with frequent agitation for not less than eight days, and finally filtered. 4. The resultant product is a brown-black, clear tincture, which on the addition of water forms a cleanly, yellowish emulsion, the color and certain other characters varying with the kind of coal-tar employed. 5. The tincture is stimulating, and is to be prescribed, usually largely diluted with from 10 to 60 parts of water, as a wash, and is useful when tar is indicated. It is often more useful when used weak than strong. 6. It takes the place of several similarly composed proprietary preparations, as "liquor carbonis detergens" and "coal-tar aponine."¹ [It is hoped that the advantages claimed for this composition are real, for if elegance and cleanliness are compatible with tar, the objections to this valuable remedy, hitherto so strong, will now disappear.]

Thermodin.—Schnitt² claims, from experimental and clinical researches, that thermodin is innocuous, but that sweats or slight chills may attend its use. After a dose of 60 cg. the fall of temperature hardly exceeds 1.6° F.; after doses of 1 g. the average remission is 2.5° F. These effects, the author states, are slowly produced, but are durable.

Thioform.—Thioform, an insoluble grayish-yellow powder, is a chemie combination of bismuth, sulphur, and salicylic acid. Therapeutically, it is said to be an almost complete substitute for iodoform, possessing, moreover, the advantage of being odorless, tasteless, and nontoxic. It does not, however, possess the specific action of the latter on tuberculous affections. Schmidt³ has used it extensively in the treatment of burns and as an application to ulcers of the leg, and has found that it produces rapid drying of the surface and greatly hastens cicatrization. Hoffmann⁴ holds that this drug is equalled in healing powers by no other therapeutic agent. Schmidt reports a case of chronic colitis in which he used thioform internally. Within two days the tympany diminished and the stools became regular. The dose administered was 0.3 g. *t. d.* Treatment was continued for fourteen days without the development of any disagreeable symptoms.

Thiol.—Dillon⁵ states that this drug, which is practically an artificial ichthyol, differs from ichthyol in that it has no disagreeable odor; the internal administration is not accompanied by gastric disturbances; used externally, it does not more than slightly stain the clothing, and this stain may be removed by washing. It is said to be curative in different forms of eczema,

¹ Am. Jour. Med. Sci., May, 1894.

² Am. Med.-Surg. Bull., June, 1894, from Sem. méd., No. 14, 1894.

³ Therap. Monats., April, 1894.

⁴ Edin. Med. Jour., Nov., 1894.

⁵ Am. Jour. Med. Sci., March, 1895.

acne, herpes, erysipelas, and in other inflammatory processes. In contusions and subcutaneous hemorrhages it promotes the absorption of the effused material.

Tolysol is a derivative of tolypyrin. Bothe¹ relates his experiences with this agent as an anodyne. He found it useful in neurasthenic headache, and often when antipyrin was without effect. The hysteric headache was sometimes influenced, sometimes not. In headache due to organic disease, in pains of syphilis and of chronic rheumatism, it proved useless. The taste is disagreeable. The dose is from 1.5 to 2.0 g. in capsule or in hot soup. In the empty stomach it may produce nausea. Vertigo was sometimes noted, but it does not occur if the recumbent position is maintained.

Trichloracetic acid is said to be an ideal cauterant, although its application may be attended with considerable pain. Von Stein² of Moscow considers it an adjuvant of the greatest value to the other forms of cauterization, increasing their efficiency and lessening their reaction. The application of the crystals or of a concentrated solution to an escharred surface prevents all putrefactive changes, almost wholly does away with febrile consequences, and promotes rapid healing. Von Stein has found it of service in the treatment of ozena; it controls the odor and reduces the crust-formation. In some cases it has led to so decided an hypertrophic tendency of the sclerosing surfaces as to demand reduction by decided cauterization. In acute coryza he employs a weak solution (from 1 : 1000 to 1 : 2000) by instillation or spray, and claims that relief is prompt. He cautions against the use of strong applications until tolerance and the inadequacy of the weaker solutions have been proved.

Tricresol.—The cresols differ from phenol by having 1 atom of hydrogen replaced by the methyl group CH_3 . There are 3 of them—orthocresol, paracresol, and metacresol. The first 2 are crystalline, and the third is a colorless, viscid liquid, boiling at about 201°C . A combination of these 3 cresols, now obtained in a pure state from coal-tar, constitutes tricresol, a white liquid, of a creosote-like odor, having a specific gravity of from 1.042 to 1.049, and soluble in water to the extent of 2.55 per cent. Its solutions are clear, and, unlike those of phenol, do not cause numbness of the fingers and hands; they are also said to be less irritating to wounds than either phenol or mercuric-chlorid solutions. Tricresol forms an important constituent of a number of germicides, as creolin, tysol, aseptol, etc. Reed³ states, as the result of his laboratory-experiments made for the purpose of testing the antiseptic value of the drug, that a 1 per cent. solution of tricresol proves fatal to the pyogenic cocci in half a minute, but if solutions of the same strength are rich in albuminous constituents, it requires a minute and a half to destroy the staphylococcus pyogenes aureus. This unusual promptness of its action, even in the presence of albumin, is an important

¹ Edin. Med. Jour., Nov., 1894, from Münch. med. Woch., No. 32, 1894.

² Therap. Gaz., May, 1894, from Monatsschr. f. Orhenheilk., Jan., 1894.

³ Ibid., July 16, 1894.

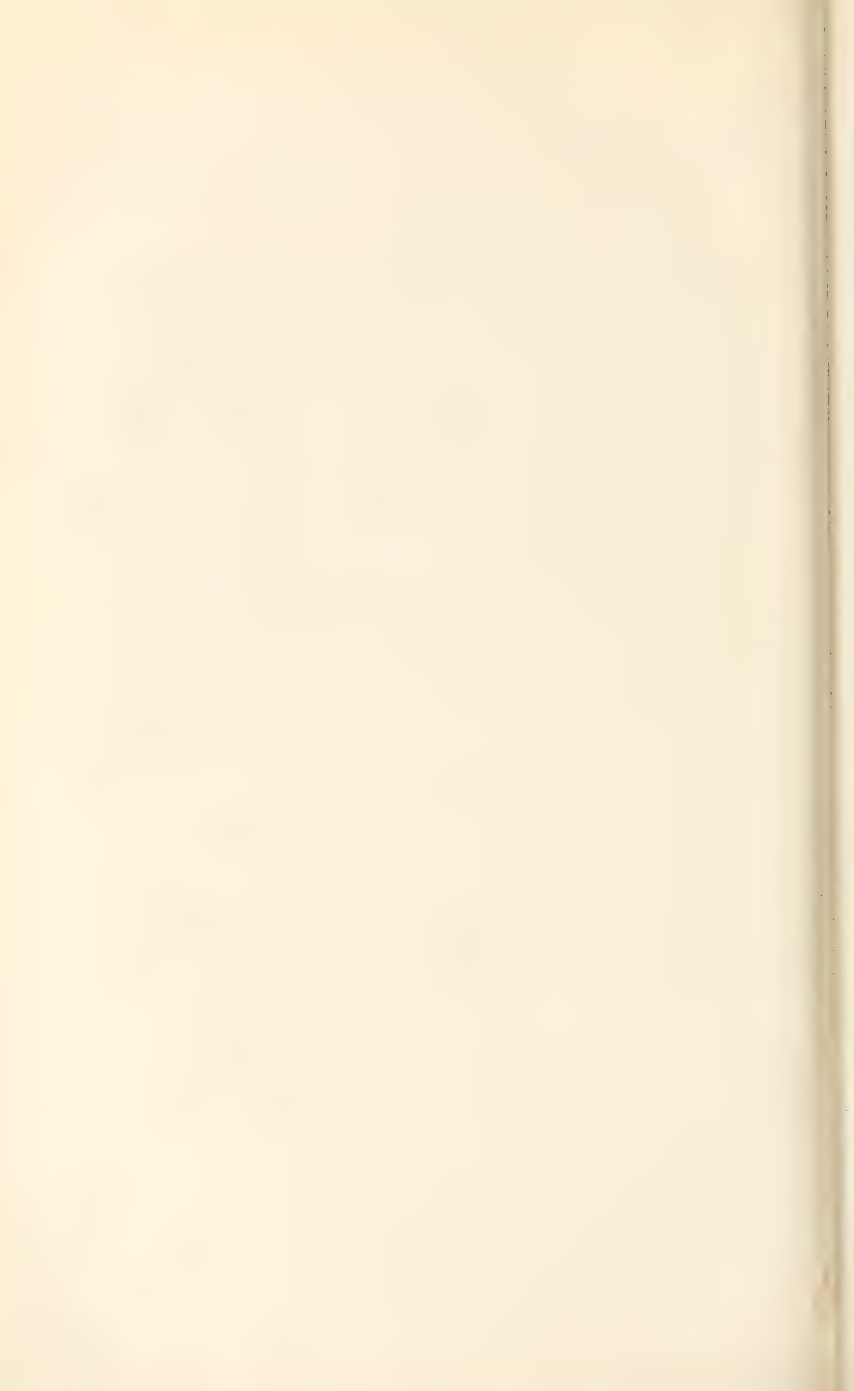
point in its favor as compared with the other germicides. Its poisonous quality is rated as slightly less than that of phenol, but since its 1 per cent. solution does the work of a 5 per cent. solution of phenol, the danger of poisoning from it is greatly diminished.

De Schweinitz¹ suggests the use of tricoresol-water, 1 : 1000, as a solvent for atropin, cocain, and eserin in ophthalmic practice. Solutions so prepared remain practically free from bacteria and fungi, and were found not to be irritating when instilled into the eye.

Uricedin.—Langstein² concludes from his experiments with this drug that it has a pronounced diuretic action—that even after prolonged use it does not irritate the heart or the kidneys. He finds that uricedin first increases the uric acid in the urine, then lessens it, and finally that the urine becomes alkaline. The action of this drug in favoring the elimination of uric acid seems to be somewhat more certain, but not always more rapid, than the actions of other remedies of this class. It may act as a mild cathartic. Uricedin is said also to relieve pain. It has no unpleasant after-effects, even when given in daily doses of 150 gr.

¹ N. Y. Med. Jour., July 28, 1894.

² Am. Jour. Med. Sci., March, 1895, from Prager med. Woch., No. 45, 1894.



ANATOMY.

BY C. A. HAMANN, M. D.,

OF CLEVELAND, OHIO.

BONES AND JOINTS.

Scleroblasts.—Under this term H. Klaatsch¹ includes the osteoblasts and odontoblasts. From his researches, chiefly carried out on fishes, he draws the conclusion that bone is of ectodermic and not of mesodermic origin, a conclusion which has also been reached by some other investigators in histogenesis. [As yet, however, this has not been proved.]

Absence of Femoral Diaphysis.—H. Grisson² reports a very rare case in which the diaphysis of the left femur was entirely absent—at any rate, no part of it could be felt. The legs and feet were perfectly well formed, the hip-joints and knee-joints were normal, and the upper and lower epiphyses of the femur were present. The soft parts of the thigh were represented by a short, thick mass of fat and muscle. At the age of two and three-fourths years the distance from the anterior superior spine to the knee-joint was 12 cm. less than on the normal side. Grisson calls attention to the extreme rarity of cases in which, with a defect of the proximal bone of an extremity, the distal parts are normal, only 3 similar cases having been reported.

Sulcus Præauricularis of the Ilium.—P. Löhr,³ after investigating this sulcus and other paraglenoidal sulci, comes to the following conclusions: 1. The sulcus præauricularis is a part of a sulcus that surrounds the entire auricular surface. 2. This sulcus affords attachment to the ligamentous structures that unite the bones. 3. Such sulci paraglenoidales are also to be found on other human bones. 4. All sulci paraglenoidales serve for the insertion of the deep fibers of the joint-capsule.

Cervical Ribs.—M. Bernhardt⁴ reports a case in which cervical ribs, to be felt upon both sides in the supraclavicular fossa, produced motor and sensory disturbances in the upper extremities. He also mentions some of the other disturbances that may be associated with cervical ribs, and refers to part of the literature on the subject.

Atmospheric Pressure in Joints.—N. A. Gerken⁵ denies that the bones entering into the formation of the hip-joint are held together partly by atmospheric pressure. From experiments upon living animals he concludes

¹ Morpholog. Jahrbuch, xxi., 1894, p. 153. ² Arch. f. klin. Chir., Bd. xlix. p. 253.

³ Anatom. Anz., 1894, ix., No. 17. ⁴ Berl. klin. Woch., xxxii., No. 4, Jan. 28, 1894.

⁵ Anatom. Anz., 1894, vol. x., No. 1, p. 35; see also Lesshaft, *ibid.*, p. 426.

that atmospheric pressure is not instrumental in maintaining apposition of the articular surfaces. He further seeks to demonstrate this fact by the clinical observation that in so-called paralytic luxations of the hip, as seen in young children, the articular surfaces are not in contact, whereas, according to the views of the Weber brothers, they should be held in contact by atmospheric pressure. J. Fessler¹ has determined the resistance of the ligaments to traction and force exerted upon them. The individual joints are taken up in detail. He finds that the strength of the ligaments exceeds from ten to one hundred times the power of atmospheric pressure in holding the bones together; thus he, in the main, confirms Gerken's views.

Undescribed Facets on the Astragalus.—Fawcett² refers to two undescribed facets on the astragalus: one on the inside of the head, below the facet for the scaphoid, and separated from it by a faint ridge; it is produced by the tendon of the tibialis posterior muscle. The other facet is "seen between the posterior half of the outer border of the trochlea of the astragalus and the corresponding part of the base of the triangular facet for the external malleolus; it is triangular in shape, the apex of the triangle being at the posterior surface of the astragalus." "This facet is caused by the inferior tibiofibular ligament during flexion of the ankle-joint in walking."

Movements of the Metacarpophalangeal Joint of the Thumb.—F. G. Parsons³ has investigated the movements of this joint, and summarizes his results as follows: 1. That the amount of flexion at the metacarpophalangeal joint varies from 20° to 90°. 2. That the left thumb is on an average 3° or 4° more movable than the right. 3. That the thumbs of women are more movable than those of men, as a rule. 4. That the thumbs of laboring men are less movable than those of men belonging to the nonlaboring classes. 5. That the thumbs of children, especially of young children, are more movable than those of men or women. 6. That manual labor tends to decrease the mobility of the joint by from 4° to 5°. 7. That the limitation of flexion is due to the ligaments, and that the head of the metacarpal bone adapts itself to the amount of movement allowed.

VASCULAR SYSTEM.

Homologies of the Limb-arteries.—Stieda⁴ has reached the following conclusions regarding the homologies of the limb-arteries: The peroneal is the real continuation of the popliteal artery, the anterior and posterior tibial being only branches; the common interosseous of the forearm is the chief vessel, and the radial and ulnar are branches; the continuation of the main arterial trunk of the upper extremity is the anterior interosseous. Thus the anterior interosseous is the homologue of the peroneal. The posterior interosseous is homologous with the anterior tibial, the median with the posterior

¹ Festigkeit der Mensch. Gelenke, etc., München, 1894, p. 266.

² Edinburgh Med. Jour., May, 1895, p. 987.

³ Jour. of Anat. and Physiol., 1895, N. S., vol. ix, p. 46.

⁴ Verhandl. der Anat. Gesellsch., 1894.

tibial; the radial and ulnar arteries have no homologues in the leg. [Stieda's conclusions agree with those of Zuckerkandl.¹]

Anomaly of the Profunda Femoris.—Zaaizer² and Schrutz³ report 3 cases in which the profunda femoris artery formed a loop around the femoral vein. [This variation is a very rare one.]

Cardiac Nerves.—P. Jacques⁴ has examined the cardiac nerves with the aid of the Golgi and Ehrlich methods. Part of the nerves for the heart-muscle form a subpericardial plexus from which filaments pass to the muscle-fibers as well as to the serosa, where they form networks. With this plexus there are found many small multipolar ganglion-cells. There is also a sub-endocardial plexus, from which filaments pass to the muscle-fibers and to the endocardium. The auriculoventricular valves have numerous nerve-filaments. The branches destined to supply the muscle-fibers form a plexus in the myocardium, from which intermuscular filaments are derived, and these give off end-fibrillæ that innervate the muscle.

Mode of Finding the Middle Meningeal Artery.—Steiner⁵ gives the following rules for finding the branches of the middle meningeal artery: A line is to be drawn from the middle of the glabella to the tip of the mastoid process; at the middle of this line a perpendicular is to be erected; where this vertical line crosses a line drawn horizontally around the skull through the middle of the glabella can be found the anterior branch of the artery. Where a vertical line through the anterior border of the mastoid process meets the horizontal line the posterior branch may be found.

Pulmonary and Aortic Semilunar Valves.—Windle⁶ has examined the arrangement of the cusps of the semilunar valves of the aorta and pulmonary artery in 100 hearts. In 15 cases the arrangement described by Valsalva existed—*i. e.* one anterior and two posterior cusps were found in the pulmonary valve, and two anterior and one posterior in the aortic valve. In 85 the arrangement described by Sibson existed—*i. e.* two in front and one behind in the pulmonary artery, and one in front and two behind in the aorta. He qualifies these statements by the following: "In saying this, however, it is important to note that the description is only a rough one. It is in only comparatively few cases that the two anterior cusps of the pulmonary artery are equally anterior, and that the same is true of the two posterior cusps of the aorta; indeed, more true, for the arrangement in the pulmonary orifice tends to be more strictly in conformity with the description than that in the aortic."

ALIMENTARY CANAL.

Obliteration of the Vermiform Appendix.—Zuckerkandl⁷ has found the vermiform process obliterated in 55 out of 232 cases (23.7 per cent.). The

¹ Merkel and Bonnet's Anat., Heft, 1894.

² Anat. Anz., ix., 1894, p. 502.

³ Idem, 1894, ix. p. 727.

⁴ Jour. de l'Anat. et de la Physiol., xxx. p. 622, 1894.

⁵ Arch. f. klin. Chir., 1894, p. 100.

⁶ Jour. of Anat. and Physiol., vol. xxix., Jan., 1895.

⁷ Merkel and Bonnet's Anat. Hefte, Bd. iv. p. 99.

histologic changes are as follows: The mucous membrane atrophies, glands disappear, and the opposed surfaces of the membrane adhere; at the same time or before this the submucosa becomes thicker and the fat in it increases in amount; the muscular coat remains unchanged or perhaps undergoes thickening. After obliteration has occurred the adenoid tissue disappears and the remaining connective tissue of the mucosa atrophies, together with the submucosa. The author agrees with Ribbert in stating that these changes are not inflammatory or pathologic in their nature, but are processes going on in an organ which has become functionless.

R. J. A. Berry,¹ after a careful examination of 100 bodies, arrives at the following conclusions [most of them are confirmatory of previously known facts]: 1. Average dimensions of the cecum are 6 cm. in length and 7 cm. in breadth; these dimensions are never equal, and bear no relation to sex. 2. The size of the cecum varies with age, being larger absolutely and relatively in the adult than in the child. It seems that the ceca of insane persons often show some abnormality in size, shape, or appearance. 3. The third type of cecum (Treves) occurs in about 90 per cent. of all adult cases. 4. The cecum is surrounded and invested by peritoneum in 94 per cent. of cases; a mesocecum does not exist.

Anomalies of the Large Intestine.—Curschmann² gives a full and interesting account of anomalies of the large intestine, and refers to their clinical importance. Among those to which he refers are the following: 1. Congenital flexures in the ascending colon and cecum, so that the fundus of the cecum looks toward the diaphragm; this involves also, of course, a change in the position of the appendix. 2. Congenital shortening of the ascending colon, causing the appendix to lie near the border of the liver or even under it; in a case under the care of the author recurring attacks of appendicitis had been mistaken for biliary colic; at the autopsy the above anomalous position of the cecum was discovered. 3. Absence of the usual flexures (hepatic and splenic), with the formation of loops. In some of these cases the colon may lie in front of the liver, leading thus to mistakes in the estimation of the size of this organ; in the cases in which the area of hepatic dulness anteriorly is lessened by the presence of the colon the dulness will be of normal extent in the axillary line and posteriorly. 4. Increase in size and extent of flexures, leading to disappearance of splenic dulness. Loops formed by the transverse colon, leading to changes in the position of the stomach, spleen, and kidney. Curschmann saw 2 cases of "wandering spleen" produced by the adhesion of the splenic flexure to this organ. 5. Congenitally large sigmoid flexure, a predisposing cause of volvulus.

Nerves of the Liver.—H. J. Berkley³ has demonstrated the existence of nerves accompanying the portal vessel by a modification of the Golgi

¹ "Anatomy of the Cecum," *Anat. Anz.*, vol. x. p. 401, 1895.

² *Deutsch. Arch. f. klin. Med.*, Bd. liii. S. 1-33.

³ *Johns Hopkins Hosp. Rep.*, iv. 4, 5, 1894.

rapid-staining process, preceded by treating the tissue with picric-acid solution. The nerve-fibers supply the smooth muscles of the biliary passages, and probably also penetrate the cement-substance between the epithelial cells of these passages. Medullated fibers do not exist. Some fibers proceeding from the vessel-walls are not nerve-fibers, but belong to a system of reticular tissue. He also describes cells in the vicinity of the vessel which are peculiar on account of their granular appearance and their reaction to stains. He regards them as connective-tissue cells which have received their granular matter from the blood.

Anatomy of the Stomach.—F. Martins¹ gives the result, obtained by Meltzing, of measurements of the size, position, and mobility of the normal and diseased human stomach during life. The experiments were conducted by introducing into the stomach a sound bearing an Edison lamp. The position of the light after its introduction into the stomach, as seen through the abdominal wall, was marked on the surface of the body, and thus could be ascertained the size of the organ. Among the results arrived at from the examination of 28 healthy individuals are the following: The lower boundary of the normal stomach lies considerably lower than was supposed from the examinations of Lushka and others on the dead body. The empty stomach almost reaches the umbilicus. When filled with water the position is lower still. The lower border of the stomach when this organ contains water is depressed from 4 to 11 cm., along with the lower border of the liver when the patient stands erect. The respiratory displacement of the lighted area is great in the recumbent, very slight in the erect, individual. The enlargement of the illuminated area on filling the stomach takes place chiefly to the right. He states that, not uncommonly, enormous stomachs are found which give rise to no disturbance and seem to functionate properly. The observations of Meltzing are to be published in book-form.

Length of the Intestinal Canal.—Dreike² has examined the length of the intestinal canal in the bodies of 169 Russians, and has arrived at the following results: 1. In children sex has no influence on the length of the intestinal canal; in adults males have a relatively longer intestinal canal than females. 2. Children have a relatively longer intestine than adults. 3. The large intestine is longer in proportion to the small intestine in adults than in children. 4. Pathologic changes in the intestine produce in children a considerable increase in its length. 5. Consumptives and those dying of wasting diseases have a relatively short intestinal canal. 6. Race does not seem to have any influence on the length of the intestine.

Peritoneum.—Byron Robinson³ made studies of the peritoneum in 25 autopsies, and states, among other things, that arrest of development of the cecum is due to peritoneal adhesions, which interfere with the rotation of the great intestinal loop. The cecum in 25 per cent. of the cases was found in

¹ Wien. med. Woch., No. 7, p. 290, 1895.

² Deutsche Zeitschr. f. Chir., Bd. xl. p. 43.

³ Am. Jour. Obstet., New York, 1895, xxxi. 186.

the pelvis with the appendix. Both these conditions complicate pelvic diseases.

GLANDS.

Lymphatic Glands in the Subpleural Tissue.—Heller¹ has found macroscopic lymph-glands in the subpleural tissue; they vary very much in number, size, and appearance; sometimes they are entirely absent; they are particularly common on the interlobar pleural surfaces. They vary in size from that of a hempseed to that of a lentil. Their color resembles that of bronchial glands. These subpleural lymph-glands are to be regarded as filters for the inhaled dust.

Thyroid Gland.—Alf. Kohn² has investigated the structure and relations of the glandula parathyreoidea, first described in 1880 by Sandström, and reaches the following conclusions: 1. In all the mammals, including man, which have been investigated with reference to this point, there has been found an external epithelial body (parathyroideal gland). It is a constant, paired organ, and usually lies on the external aspect of the lateral lobes of the thyroid gland, without being in direct contact with the gland-tissue. It consists of a mass of connected epithelial cell-strands, in the interstices of which there are vessel-bearing connective-tissue septa. 2. An internal epithelial body is also found constantly in the cat, and perhaps in other mammals; this body is in direct continuity with the gland-tissue. 3. There is also in the cat an external thymus lobule, just below the external epithelial body of the thyroid. Histologically, it presents the same structure as the thymus. There is also an internal thymus body in each lobe of the thyroid.

Kohn calls attention to the fact that these external epithelial bodies or parathyroid glands have usually been classed as accessory undeveloped thyroid glands. He, however, regards all the above-named structures as rudimentary in character, arising independently in the vicinity of the place of origin of the thyroid, and only secondarily acquiring closer relations with this organ.

Prenant³ has demonstrated that in the embryo of the sheep the glande thyroïdienne (the parathyroideal gland of the above description) has an independent origin; he regards it as being homodynamous with the carotid gland.

O. A. Anderson⁴ states that in the adult thyroid there are no nerve-fibrillæ between the epithelial cells of the follicles, the terminal fibrillæ ending at the basis of the follicle-cells. These perifollicular filaments are glandular nerves, not vessel-nerves. Anderson did not find any ganglion-cells in the gland; some of the structures described by certain authors as ganglion-cells are varicosities of the nerve-fibers; others are artefacts.

M. B. Schmidt⁵ describes bud-like cellular formations lying between the

¹ Arch. f. klin. Med., Bd. lv., Festschrift, p. 140.

² Arch. f. Mikroskop. Anat., 1895, Bd. xlv. p. 366.

³ La Cellule, tome x. 1ère fascicule, 1894.

⁴ Arch. f. Anat. u. Physiol., 1894, p. 177.

⁵ Arch. f. Patholog. Anat., 1894, Bd. cxxxvii. p. 330.

media and intima of the arteries of the thyroid gland; they are met with invariably in normal gland-tissue, though in varying numbers. These cell-buds protrude into the lumen of the vessel; they are usually covered with endothelial cells continuous with the intima of the arteries. The buds consist only of nucleated cells, no intercellular substance being present. Another form consists of bud-like protrusions arising from, or taking root in, the media. These buds are found in the vessels of the interlobular septa and in those branches passing to the lobules, most commonly at the point of bifurcation; they do not exist in the veins or capillaries. The intima and the muscular coat are concerned in their production. They appear sometimes before birth, and regularly a short time thereafter, do not increase as age advances, and are not specially influenced by abnormal conditions of the organ. The buds are to be regarded as cellular new formations from the vessel-wall. They sometimes undergo hyaline degeneration. The author does not believe that they have any connection with the functions of the thyroid, but that they represent a change in the vessel-wall produced by certain circulatory disturbances at the time of transition from the fetal to the permanent condition; the cell-production is a compensatory action, as it were, adapting the size of the arteries to the narrowing of the capillaries.

Henry J. Berkley¹ agrees with Anderson's description of the entrance of nerves into the thyroid gland and their distribution with the arteries to the glandular substance, but differs from him in the description of the perifollicular networks, etc. He finds a meshwork of fibers situated almost immediately upon the basal surface of the epithelial cells of the follicles, from which the largest proportion of the nerve-endings are derived. The rami passing to the epithelial cells often bear upon their extremities little thickenings, occasionally pass into the intercellular cement-substance, and there end in a like manner. He does not find ganglion-cells.

Variations in the Form of the Thyroid Gland in Man.—C. F. Marshall² gives an account of variations in the form of the thyroid gland from observations on that organ in 60 children. In none of the cases did he find a "persistent thyroglossal duct present, or any structure of the nature of a 'canal of His.' " He finds that the gland varies very much in different individuals, "so much so that to speak of a 'normal' thyroid gland is absurd."

The processus pyramidalis was found developed to a greater or less extent in 43 per cent. of the cases; in 17 cases it was attached to the hyoid bone, and in 9 others to the fascia over the thyroid cartilage; in 1 instance the lower end of the process bifurcated, each one of the lateral lobes receiving one of the divisions. This bifurcation of the pyramidal process is of interest, inasmuch as it is a persistence of the embryonic bifurcation of the median thyroid rudiment. In one instance there was a double pyramid.

Development of Lymphatic Glands.—G. Lovell Gulland³ has investi-

¹ Johns Hopkins Hosp. Rep., vol. iv., 1895, Nos. 4, 5, p. 113.

² Jour. of Anat. and Physiol., 1895, N. S., vol. ix. p. 234.

³ Jour. of Pathology and Bacteriology, 1894, ii. 4, p. 447.

gated the development of the lymphatic glands in man, mammals, and birds. He finds that the glands of the nape of the neck first appear; then follow those at the elbow, popliteal space, mesentery, etc.

The early lymph-glands are formed in places where a number of lymph-vessels come together and form plexuses; these lie in the neighborhood of the larger arteries. The glands arise from a mass of connective tissue inside of the plexus; the plexus is well supplied with capillaries; the connective tissue becomes condensed, the network becomes finer; leukocytes lodge in the interstices and increase in number.

NERVOUS SYSTEM.

Pituitary Body.—Berkley¹ gives the following results of his investigations of the nerve-elements of the pituitary body: "The silver-method shows that the pituitary gland has retained in one of the higher orders of vertebrates (dog) its double role of secretory and nervous function intact; the former perhaps modified, the latter, the original special-sense organ, probably lying simply quiescent, not atrophied, and only changed in so far as to admit of a slightly different arrangement of its constituent elements."

Terminal Organs.—A. Ruffini² has described two new terminal organs found in the integument of the tips of the fingers in 16 individuals. One of them is identical with the end-organs found in the tendons by Golgi and Mazzoni; the other, which has not yet been described, lies between the stratum reticulare and the subcutaneous tissue; it is from 24 to 135 microns in length and 5 to 20 microns in width. The nerve-fiber destined to form the end-organ divides into a number of branches, which upon entering the end-organ lose their myelin and break up into a network of fine filaments. The supporting substance consists of connective tissue and elastic fibers. Blood-vessels accompany the end-organ, surrounding it, but not entering its interior.

A. S. Dogiel³ has described end-organs in the palpebral conjunctiva; these organs are identical with those found in the bulbar conjunctiva, being, in fact, true "end-bulbs" of Krause.

Nerves of the Salivary Glands.—C. Arnstein,⁴ from his examinations of the salivary glands, pancreas, Harder's and other glands, reaches the following conclusions: The gland-nerves form in tubular as well as in acinous glands a network on the membrana propria (epilemmal network). From this filaments penetrate the membrane and run as pericellular filaments in contact with the cells. These pericellular filaments do not form a plexus or network, but terminate, with or without division, in short varicose terminal fibrillæ whose configuration and dimensions vary; there is thus no terminal network, but a peculiar end-apparatus formed by budding and secondary union of varicose filaments.

¹ Johns Hopkins Hosp. Rep., 1894, vol. iv., Nos. 4 and 5.

² Arch. Ital. de Biol., xxi. 2, p. 249.

³ Arch. f. Mikroskop. Anat., Bd. xlv. p. 15.

⁴ Anat. Anz., vol. x., No. 13, p. 410.

Infundibular Region.—Berkley ¹ finds that ependymal neuroglia-cells are to be found in the infundibular region of the adult dog; these cells were formerly thought to be absent from the central nervous system of the adult mammal.

Cerebellum.—A. Lui ² made examinations of the cerebelli of various animals in order to determine to what extent there was a relation between the complete development of this part of the brain and the ability of the animal to stand upright and walk. Omitting details, it suffices to state that there was found a distinct relation—*i.e.* the complete development of the cerebellum in its histologic details corresponds to the time when the animal can stand and walk.

Corpus Callosum.—Oskar Vogt ³ states that commissural fibers of the corpus callosum not only connect identical parts of the opposite hemispheres, but also other parts, as was shown by Sherrington. ⁴ The characteristic of commissural fibers is that they connect homologous parts of the opposite hemispheres.

Connection between Corpus Striatum and Optic Thalamus.—Edinger ⁵ describes an extensive fiber-system in mammals (present also in fishes, amphibians, reptiles, birds, and selachians) which connects the corpus striatum with the nuclei of the optic thalamus and with the subthalamic region. The thalamus and subthalamic region are thus intimately connected with the forebrain. From the corpus striatum no fibers arise which pass farther caudalward than the substantia nigra. Edinger suggests for the newly-described fiber-system the name *radiatio striothalamica*.

Neuron.—Flatau ⁶ presents the outlines of our present conception of the structure of the central nervous system, as based upon the researches of Golgi, Cajal, and others, and shows that the chief physiologic process and certain pathologic phenomena can be explained on the basis of these views. He reviews the structure of the neuron.

Cerebral Convulsions.—Mingazzini ⁷ in an extensive monograph describes the characteristics of the cerebral convulsions of man and the other primates in both sexes; he also has studied the brains of individuals with abnormal and deformed skulls, of insane and criminal persons, and those of different races. He states as his belief that there is no "criminal type" of brain, though he found anomalous brains more common in criminals.

Anterior Pyramids of Medulla.—L. Jacobsohn, ⁸ after his attention had been called to the position of the anterior pyramidal tract in the medulla in a pathologic case, investigated the subject more thoroughly, and finds that those pyramidal fibers which do not decussate, but pass down the anterior

¹ Anat. Anz., vol. ix., No. 24, p. 746.

² Arch. Ital. de Biol., xxi.

³ Neurolog. Centralbl., 1895, No. 5.

⁴ Proc. Physiolog. Soc., 1892.

⁵ Verhandl. der Anat. Gesellsch., 1894.

⁶ Deutsch. med. Woch., 1895, No. 13. See also v. Kupfer: Münch. med. Woch., xli., No. 13, p. 241; v. Kölliker: Wiener med. Blätter, xvii. pp. 603, 619, 638.

⁷ Il Cervello in Relazione con i Fenomeni psichici, Torino, 1895.

⁸ Neurolog. Centralbl., 1895, No. 8, p. 348.

columns of the cord, lie in the medulla on the proximal side of the decussation of the pyramids, in the lateral angle of the pyramid.

Vagus and Spinal Accessory.—Grabower,¹ who had previously shown that the laryngeal muscles are supplied from the vagus, and not from the spinal accessory, has again investigated the subject. He regards the spinal accessory as a pure spinal nerve; a cerebral accessory portion does not exist; the accessory portion does not become connected with the vagal nucleus, but with that of the hypoglossal. The nucleus ambiguus is widest at the point where the auditory nucleus has its greatest breadth, and has some ten to twenty cells.

Nucleus of Fifth Nerve.—Lugaro² has traced in preparation of rabbit embryos, stained by Cajal's method, the direct continuity of the processes of the ganglion-cells which lie in the region of the corpora quadrigemina at each side of the Sylvian aqueduct with the fibers of the descending root of the fifth nerve. The cells of this nucleus of the descending root of the fifth nerve are from 15 to 35 microns in diameter, and mostly unipolar. The nerve-fibers could be followed to the situation where the motor branch of the trigeminus comes from the pons.

ORGAN OF VISION.

Ora Serrata and Zonula.—W. Schoen³ makes the very interesting statement, that in the retinæ of young animals and newly-born children, as well as in children under school-age, there are no ora serrata, the line of transition of the pars optica retinæ into the pars ciliaris being, to the unaided eye, a straight one. The denticulations formerly described do not exist. Upon microscopical examination, however, the border of the retina is seen to be beset with small processes, of which about twenty are found occupying the position of one of the formerly described "ora serrata." From these small processes the fibers of the zonula arise, one fiber arising from each process; the fibers are some 700 to 800 in number. A second, deeper group of zonula-fibers arises from the epithelial cells of the pars ciliaris, each cell giving origin to one fiber. The fibers of the zonula therefore belong to the retinal tissue, and represent a continuation of the membrana fenestrata and the radial supporting fibers; the continuation of the retina is adherent to the capsule of the lens. Schoen states that the macroscopic ora serrata are produced by functional changes, being, in other words, the result of use of the eyes.

Neuroglia-cells in Optic Nerve and Optic Tract.—R. Greef⁴ has examined the neuroglia-cells in the optic tract, optic nerve, and in the retina of various animals by the aid of Cajal's method. He found the same "spider"-cells or glia-cells at all points, from the optic tract to the periphery of the retina, as are found in the white substance of the brain, thus adding another proof that the retina and optic nerve are morphologic-

¹ Arch. f. Laryngol. u. Rhinol., 1894, Bd. ii.

² Arch. di Ottalmologia, vol. ii.

³ Anat. Anz., 1895, Bd. x. p. 360.

⁴ Arch. f. Augenheilk., xxix. p. 324.

ally parts of the cerebrum. The processes of the glia-cells never anastomose, but, intertwining with one another, surround the nerve-fibers. Greef finds the spider-cells to vary in different classes of animals, and the lower one descends in the scale the more imperfect the neuroglia of the optic nerve becomes.

LUNGS.

Congenital Absence of the Left Lung.—Tichomiroff¹ records the case of a female, aged twenty-four, well developed physically, who died of pneumonia after recovering from a previous attack of pleurisy. At the autopsy the left lung was found to be entirely absent; no traces of the left bronchus existed; the left side of the diaphragm was adherent to the chest-walls up to the position of the sixth rib; there was present a left superior vena cava, and the left lobe of the thymus exceeded in size the right; there were no differences in the vagi of the two sides, but the left superior cervical ganglion of the sympathetic was very long and thin and had local thickenings. There were no marked anomalies in the abdominal organs. Slight scoliosis (convexity to the right) existed, and the right side of the chest was a little more prominent than the left. This case shows that adult life may be reached though one lung is congenitally absent. The author refers to the fact that in 4 other cases of absence of the lung which he has collected from the literature it has always been the left which was absent; this is interesting when it is remembered that the left lung is less developed than the right, and that in snakes the left lung is quite rudimentary.

Differences in the Bronchial Tubes on the Two Sides.—Dr. Charles Cary, at the meeting of the Association of American Physicians in Washington in May, 1895, demonstrated preparations of casts of the bronchial tree which showed that the bronchial tube to the upper lobe of the right lung is given off near the beginning of the right bronchus, about two inches higher than the corresponding tube on the left side; in other respects the arrangement is alike on the two sides. It is interesting to note that in the sheep and certain other animals the tube to the upper lobe of the right lung comes directly from the trachea. To this peculiarity in the arrangement of the human bronchial tubes [which, however, was previously known] Cary attributes the differences in the auscultatory and tactile phenomena of the upper portions of the two sides of the chest.

Intrinsic Pulmonary Nerves.—Berkley² has described the intrinsic pulmonary nerves in certain mammals: they originate chiefly from the plexuses accompanying the bronchial arteries, and are found in the alveolar septa, interalveolar terminations having been seldom observed. The fibers end in the bronchial muscular tissue as rounded enlargements; no terminations are found between the bronchial epithelial cells, though Berkley thinks this is due to their not staining.

¹ Internat. Monatschr. f. Anat. u. Physiol., 1895, Bd. xii. S. 24.

² Johns Hopkins Hosp. Rep., 1894, iv. 4, 5.

GENITO-URINARY ORGANS.

Anomaly of Uterus.—Holländer¹ describes the following very rare anomaly of the uterus which he encountered during the performance of a celiotomy: There were found two uteri, the posterior one being a normal organ with its adnexa; connected with this uterus there was another one, anterior to it. The two uteri had a common cervix; the anterior of the two organs had no adnexa, though there were lateral peritoneal ligaments; it had become pregnant. Holländer explains the anomaly by stating that probably the Müllerian ducts or one of them had grown excessively, leading to a folding off of the portion which developed into the anterior uterus.

Pseudo-hermaphroditism.—Maurice A. Walker² reports a case of an individual, twenty-four years of age, with the general form of a "masculine woman." The breasts were well developed and rather pendulous and had erectile nipples. The penis was $2\frac{1}{2}$ inches in length during sexual excitement. Perineal hypospadias was present. The scrotum was cleft, each half containing a testicle. The individual was able to have imperfect connection with a female. The curious fact in the case was that at the age of sixteen or seventeen he first had more or less regular attacks of epistaxis, which at present occur quite regularly, every four or five weeks; they last one or two hours, and come on two or three times a day for about two days. These attacks are accompanied by malaise and an "ill-defined feeling of tenderness in the loins and lateral pelvic regions." During these periods the voice is several tones higher in pitch than at other times. Uterus and appendages could not be discovered.

Nerve-endings in Female Genitalia.—Köstlin³ has examined the nerve-endings in the female genitalia by the aid of Cajal's modification of Golgi's method. His studies were chiefly made on pigs, sheep, calves, and rabbits. In the human vagina he found that the papillæ of the mucosa had capillary loops along which fine nerve-filaments pass, which run vertically between the flattened epithelial cells, and terminate near the surface in nodular enlargements.

Anomaly of Genitalia.—Shattock⁴ showed a male fetus which presented reptilian characters in the sexual ducts. Extroversion of the bladder and prolapse of the posterior segment of the intestine also existed. Both Müllerian ducts persisted, and remained quite distinct from each other, opening in the neighborhood of the ureters on the extroverted surface of the bladder. On one side the vas deferens opened into the ureter.

METHODS.

Formalin.—The substance commonly known in the trade as formalin (a name applied to it by Schering) has been used considerably of late for hardening and preserving tissues both for macroscopic and microscopic

¹ Centralbl. f. Gynäkol., 1895, No. 4, p. 375.

² N. Y. Med. Jour., Oct. 6, 1894.

³ Fortschr. der Med., 1894, xii. 11 and 12.

⁴ Lancet. Feb. 23, 1895.

study. As met with commercially, it contains 40 per cent. of the pure formic aldehyde; stronger solutions are not permanent. (For other articles on its use, besides those given below, see F. Blum,¹ J. Blum,² Hermann,³ Eccles,⁴ Bergonzoli.⁵)

R. Marie,⁶ for the purpose of hardening the brain and spinal cord, places them in a 1 per cent. solution of formalin for four or five days. Sections can then be made. The usual staining methods are available; if staining by the Weigert-Pal method is desired, the sections require to be placed subsequently in chromic-acid solution.

Magnus⁷ has obtained good results by the following method: The tissue is placed in $\frac{1}{2}$ per cent. solution of formalin for from two to four weeks. Small pieces are then placed in Müller's fluid in a brood-oven, where they remain for a week at a temperature of 37° C.; then they are placed for a day in absolute alcohol, and are then imbedded in celloidin. The cut sections are again put into Müller's fluid for a few days, then washed in alcohol, and allowed to remain at least two days in the Weigert-Pal hematoxylin solution. The myelin sheaths become blue, the ganglion-cells become very distinct, and the nuclei appear plainly.

Hoyer, Jr.,⁸ found 1:10 and 1:100 solution of formalin satisfactory for macroscopic preparations. The 40 per cent. commercial solution was used for microscopic preparations. Pieces of tissue 1 c.c. in size were completely hardened in a few hours; they were then put into alcohol, which was gradually increased in strength for twelve to twenty-four hours, and were then imbedded in paraffin. Hematoxylin and anilin dyes were found to act satisfactorily; not so alum-carmin and methyl-green. Hoyer has also used formalin in the preparation of specimens with the Golgi stains. In the discussion on the paper Tornier said that those working with material prepared with formalin complained of irritation of the eyes and the respiratory tract. Stieda has used it in dilute solution for preserving cadavers, but found it inefficient. Waldeyer states that this substance is excellent for retinal preparations and those of the vitreous body.

Th. Leber,⁹ using the formalin prepared by Meister, Lucius, and Brüning, containing 40 per cent. of formaldehyd in a mixture of alcohol and water, found that it hardens tissue by coagulation without dehydration. Hardening is very rapid, and takes place without shrinking of the tissue, so that pigs' eyes, after remaining in a 10 per cent. solution for one day, could be cut; when they remain longer in the solution they are not changed. The natural colors are retained, and also the transparency, the lens and cornea becoming only slightly turbid. Microscopic examinations can be carried on well.

¹ Zeitschr. f. Wissensch. Mikroskop., 1893, Bd. x., and Anat. Anz., 1893, Bd. ix.

² Zoolog. Anz., 1893, Bd. ix.

³ Anat. Anz., 1893, Bd. ix.; also *ibid.*, 1895, Bd. x., No. 15, p. 494.

⁴ Brit. Med. Jour., 1894, i. p. 1124.

⁵ Bull. de la Soc. d'Anat., Dec., 1894.

⁶ Verhandl. der Anat. Gesellsch., 1894.

⁷ Boll. Scient., Pavia, 1894, xvi. p. 18.

⁸ Neurolog. Centralbl., Jan. 1, 1895.

⁹ Münch. med. Woch., July 24, 1894, p. 605.

Transparent Macroscopic Preparations of the Organ of Hearing.—L. Katz¹ gives a modification of a method previously devised by him for making these preparations. The temporal bones are placed in $\frac{1}{4}$ per cent. solution of chromacetic acid, to which have been added 10 c.c. of 1 per cent. osmic-acid solution for from four to six weeks, in order to harden them. Then the bones are decalcified in 20 per cent. nitric acid; after decalcification they are placed in 90 per cent. alcohol, and then in xylol. In twenty-four hours the xylol makes them completely transparent, and the preparations can be put into peculiarly constructed glass cases filled with balsam, taking care to exclude air-bubbles.

MISCELLANEOUS.

Supernumerary Spleens.—Albrecht² mentions a case, shown at a meeting of the Vienna Medical Society, of a very large number of spleens found in the mesogastrium, peritoneum, on the mesentery and transverse mesocolon, in Douglas's pouch, etc. There was a spleen "the size of a walnut" in the usual position of that organ, with the splenic artery and vein in their normal position. Every one of these spleens had a capsule, was covered by peritoneum, and exhibited the histologic appearance of splenic tissue. Toldt explains the case by assuming that other parts of the celomic epithelium besides that of the mesogastrium are capable of forming splenic tissue.

Eleidin.—Dreyse and Oppler³ have investigated this substance in normal and pathologic skin. It can be studied best in integument which has been hardened by alcohol and the sections stained with picrocarminate of ammonia and sulphate of nigrosin. Eleidin is found in the stratum lucidum, in the walls of the hair-follicles, and in part of the duct of the sweat-glands. It exists in the shape of smaller or larger drops. The amount is dependent on the thickness of the superficial layers of the epidermis, and is therefore greatest in the sole of the foot, etc. In a five-month embryo they did not find eleidin, but it was found in an eight-month embryo. None was found in the tongue nor in the inner layer of the prepuce or inner surface of the labia minora.

Movements of the Nucleolus through the Action of Gravity.—F. H. Herrick⁴ has noticed that in the ovary of the lobster (*Homarus Americanus*) the nucleoli of the ova are commonly eccentric in position: he shows experimentally that this eccentricity is due to the action of gravity and to the structure of the nucleus. The nucleolus, which is of greater specific gravity than that of the caryolymph of the nucleus, sinks to the bottom along with the chromatophilous substance of the nucleus.

Pithecanthropus Erectus.—E. Dubois⁵ has described a new anthropoid mammal, the remains of which were found in excavations from the Pleisto-

¹ Berl. klin. Woch., xxxii., No. 1, 1895.

² See review in Lancet, 1895, i. p. 1346.

³ Arch. f. Dermatol. in Syph., 1895, xxxi. p. 63.

⁴ Anat. Anz., 1895, Bd. x. p. 337.

⁵ Fol. Batav., 1894; see also Krause, in Internat. Monatschr. f. Anat., 1894, Bd. xii. p.

cene or Upper Pliocene bed of the river Bengawan in Java; he gives to it the name *Pithecanthropus erectus*. This mammal, which he regards as a "connecting link" between man and the anthropoids, must have existed prior to the Glacial period. Its height was estimated at 1.7 m. The skull, the capacity of which was estimated at about 1000 c.c., was that of an adult; its surface was smooth, lacking cristæ, so that it must be a species of *hylobates*, all other adult anthropoids having cristæ (Krause). The dentition was like that of anthropoids. The femur is exactly like that of man.

Krause calls attention to the fact that in the bed of streams the most heterogeneous things are found close together, and says that the description given by Dubois is that of an ape's skull on a human trunk, an evident impossibility. Nevertheless, Krause believes that Dubois has discovered a new species of *hylobates* with large cranial capacity, and that he has shown that in the Upper Pliocene beds of Java there were human beings of the same height as the present races of man and having the same conformation of the femur.

Prof. Cunningham¹ states it as his belief that the skull and femur are both human.

M. A. Pettit² seems inclined to hold the same opinion, and Sir William Turner³ does not "accept M. Dubois' opinion that we have in these remains evidence of a new genus and species intermediate between man and apes." Lyddeker⁴ believes that the skull is that of an idiotic, microcephalic human being.

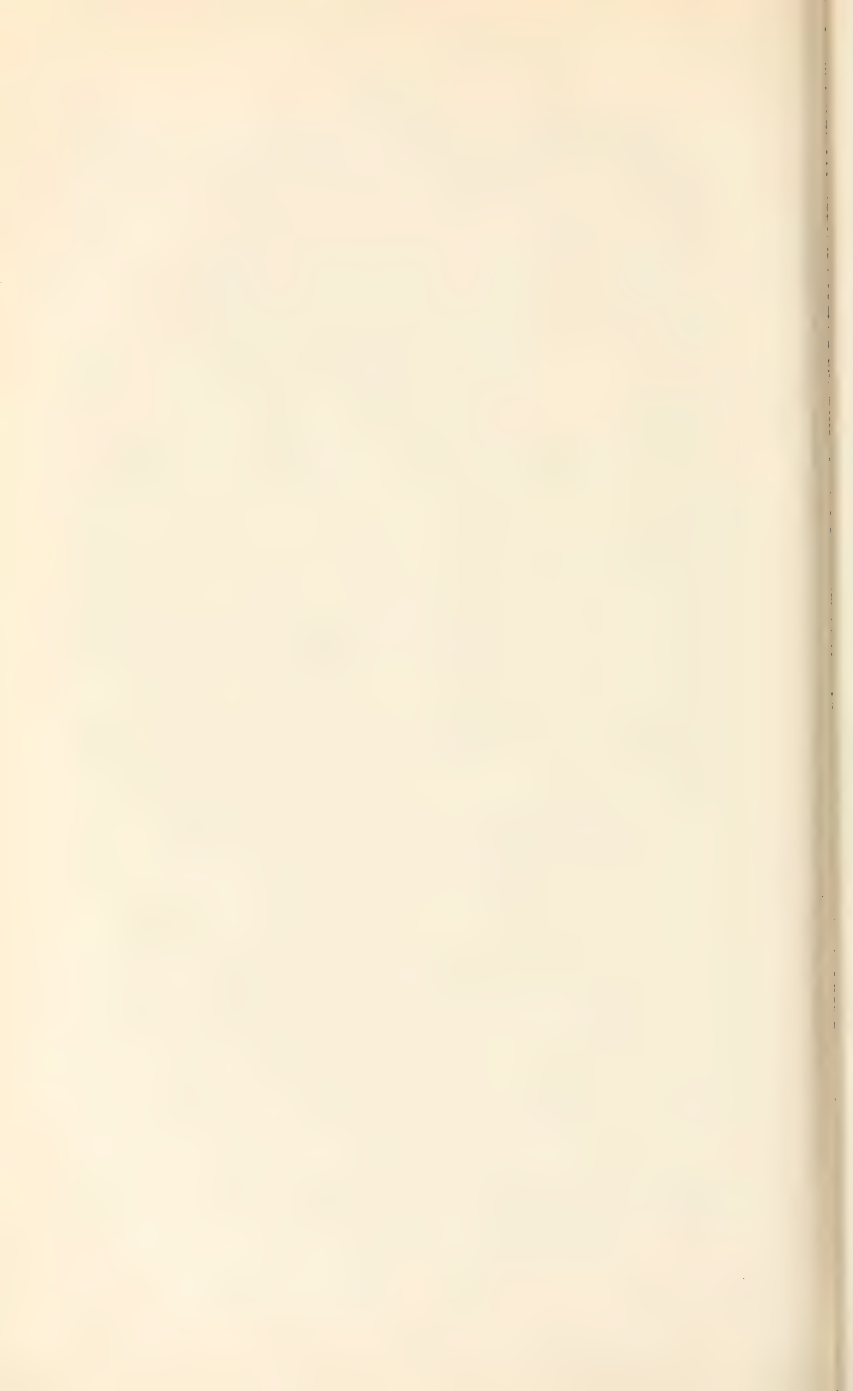
There seems to be a tendency among most of the anatomists who have written on the subject to regard the skull of "*Pithecanthropus*" as that of an ape, whereas zoologists almost uniformly regard it as that of a human being.

¹ Jour. of Anat. and Physiol., 1895, vol. xxix., part 3, p. 18.

² L'Anthropologie, tome vi., No. 1, p. 65, 1895.

³ Jour. of Anat. and Physiol., 1895, vol. xxix., April, 1895.

⁴ Nature, vol. ii. 1317, p. 291.



PHYSIOLOGY.

BY G. N. STEWART, M. D., OF CLEVELAND, OHIO.

METABOLISM.

The Glycogenic Function.—The attention of many physiologists has again during the past year been riveted on the problems of the formation and destruction of sugar in the organism and the relations of the glycogenic function to experimental and pathologic diabetes. Spitzer¹ finds that the sugar-destroying power of the blood-serum of diabetic patients, and of animals in which temporary glycosuria has been caused by phloridzin, is not less than that of normal blood. He accordingly [and with justice, if his results can be considered as conclusive] refuses to accept the theory of Lepine and Barral, that diabetes is essentially due to a diminution in the activity or in the amount of the sugar-forming ferment of the blood. [But the difficulty that besets all investigations having for their object the determination of minute differences in the quantity of sugar in a liquid like blood renders it necessary to use great caution in interpreting the results.] This difficulty is well illustrated in an elaborate review and criticism by Noël Paton² of Pavy's³ doctrines as to the formation and fate of sugar in the animal body, and particularly of Pavy's assertion that the liver does not produce sugar, but destroys it. [The resume of the evidence in favor of the orthodox view of the constant production of sugar in the liver and its disappearance in the circulation is compact and convincing.]

An important contribution to our knowledge of the metabolic processes in diabetes has been made by Laves⁴ and by Weintraud and Laves⁵ with a respiration-apparatus, constructed by Hoppe-Seyler⁶ on the principle of Regnault and Reiset, but large enough to contain a man. A diabetic patient, suffering from the severe form of the disease, and excreting constantly in his urine acetone, acetoacetic acid, and β -oxybutyric acid, was compared with a normal individual. The oxygen consumed per kilo of body-weight per minute varied from 6.23 to 5.74 c.c. in the diabetic as against 4.58 to 3.72 c.c. in the healthy man. In correspondence was the much higher heat-equivalent of the diet of the diabetic patient. The amount of carbon dioxid pro-

¹ Berlin. Klin. Wochensh., Oct. 15, 1894.

² Edin., Med. Jour., Dec., 1894.

³ The Physiology of the Carbohydrates.

⁴ Zeitschr. f. physiol. Chem., xix., p. 590.

⁵ Ibid., p. 603.

⁶ Ibid., p. 574.

duced by the diabetic was astonishingly small in proportion to the diet, which was free from carbohydrates, so that the respiratory quotient was much less than in the healthy individual. In fact, the diabetic in this respect resembles a starving man who lives on the fat and proteids of his own tissues. In one experiment the patient ate a large quantity of left-rotatory sugar (levulose), but no sugar appeared in the urine; but when bread was taken the urine contained sugar. Experiments were also made on a dog in which the pancreas had been transplanted by Minkowski's method under the skin of the abdomen. The urine, as is known, remains under these circumstances free from sugar. The oxygen consumption and carbon-dioxid output were found to be normal. What is remarkable, however, is that when the pancreas was now extirpated the gaseous exchange still remained normal, although sugar appeared in the urine. The administration of dextrose did not affect the respiratory quotient after excision of the pancreas, while levulose, after excision as well as before, immediately increased the quotient. This is fresh proof that levulose is used up in the organism in the absence of the pancreas, while dextrose is not.

Pautz¹ has found in a long series of experiments on 24 diabetic patients, that in cases of pure diabetes, not complicated with icterus or other conditions which affect absorption from the alimentary canal, the food is used up in the body as completely as in health. [There is no experimental basis for the clinical distinction recently made between cases of diabetes in which absorption is normal and cases in which the absorption, especially of fat, is diminished—which latter group of cases Hirschfeld has tried to associate with the diabetes that follows excision of the pancreas in animals.]

Roger² announces that in rabbits inoculated with anthrax the glycogenic function of the liver is scarcely affected during the first period; but in the second period, when the symptoms of the disease are well established, glycogen may disappear from the liver and sugar accumulate in the blood. Marcuse³ has sought to solve the problem of the relation of the liver to the pancreas in regard to glycogenesis by extirpating the pancreas in frogs from which the liver has been previously removed. Under these conditions excision of the pancreas does not cause diabetes. [It must, however, be said that the basis of this induction is rather narrow, for in 7 out of 19 control animals from which the pancreas alone was removed there was no diabetes.] Levene⁴ supports the view that in glycosuria caused by phloridzin there is increased production of sugar in the tissues, and especially in the kidneys, for the blood of the renal vein sometimes contains more sugar than the blood of the renal artery. He supposes that proteids may be one source of the sugar.

¹ Zeitsch. f. Biologie, xxxiv., p. 197.

² Archives de Physiologie, 1894, p. 64.

³ Verh. d. Berl. physiol. Ges., Archiv. f. Physiol., 1894, p. 539.

⁴ Jour. of Physiol., xvii., p. 259.

An interesting contribution to the much-studied subject of temporary or **alimentary glycosuria** has been made by Miura,¹ who used the phenylhydrazin test to determine the *kind* of sugar present in the urine. After a very large meal of rice (equivalent to 6.4 g. ash-free and water-free starch per kilo of body-weight), which, as he mentions, tasked even his Japanese digestion to dispose of, there was not a trace of sugar in the urine. Glucose, cane-sugar, and lactose, when taken in large amount, appeared as such in the urine. The same was true of levulose and maltose when given to a dog, but when cane-sugar was given, the dog's urine contained both cane-sugar and invert sugar. Zuntz² finds that when physiologic albuminuria is present in soldiers the urine is always free from albumin after a march.

General Metabolism.—I. Munk³ has published an elaborate paper, a large part of which is a criticism covering the whole range of Voit's teaching on metabolism. Voit's distinction between organ-proteid and circulating proteid Munk rejects entirely, the work of Pflüger and others having shown, in his opinion, that the quantity of proteid broken down depends not on the amount of circulating proteid at the disposal of the tissues, but on the nutritive condition of the cells. And Munk has himself found that a dog fed with proteids and carbohydrates after a thirty days' fast used up, both absolutely and relatively to body-weight, *less* proteid than the minimum consumed during starvation. This can hardly be explained except on the supposition that the proteid taken in was first of all built up into organ-proteid. He finds, as others have done, in opposition to Voit, that peptone can fully replace ordinary proteids in the food. He points out that the allowance of proteid (118 g.) in Voit's dietary for the average workman is too high, and that in nearly all cases equilibrium is maintained with 100 g. He finds that when a definite quantity of proteid is given to a dog in three meals, at intervals of six to eight hours, less is "laid on" and more used up, as shown by the greater excretion of nitrogen in the urine, than when the same amount is given in one meal. In a dog fully five-sixths of the nitrogen of the proteid food can be replaced by gelatin, at least for a few days. Comparing his results on the metabolism of a fasting dog with those previously obtained on professional "fasting men," he mentions the curious fact that in the urine of the starving dog the phenol-forming substances are absent, while in the urine of starving men they are present in more than the normal amount. The indigo-forming substances, on the other hand, as others have found, are in hunger excreted in large quantity by the dog and not at all by man.

Rosenfeld⁴ saw after the administration of **phloridzin** a great accumulation of fat in the liver, between, not in the cells. The liver-cells were not degenerated. No such deposit of fat took place if meat or sugar were given

¹ Zeitsch. f. Biologie, xxxiv., 1895, p. 281.

² Verh. d. Berl. physiol. Ges., Archiv. f. Physiol., 1895, p. 378.

³ Pflüger's Arch., Bd. lviii., p. 309.

⁴ Centralblatt f. Physiol., June 30, 1894.

along with the phloridzin. But the giving of fat increased the accumulation, which was evidently not due to a fatty degeneration *in situ*, for when a foreign fat was administered along with the phloridzin it could be detected as such in the liver.

Weintraud¹ found that the administration of the thymus of the calf to a man caused a great increase in the amount of uric acid in the urine (2½ g. in one day). This was due to the absorption of nuclein-containing substance from the intestine.

Lieblein² saw an increase in the excretion of uric acid and the appearance of carbaminic acid in the urine of dogs after erosion of the liver by the injection of acids into the bile-duct.

Seegen³ in a research on the source of the energy of muscular work comes to the conclusion that only a small part of it can possibly be derived from glycogen. The sugar of the blood must be regarded as the most important source of mechanical energy and heat production.

Zuntz⁴ has investigated the relations of the various food-substances to the production of muscular work. With a very abundant diet of carbohydrates, fats, and proteids, a dog not only did a considerable amount of work, but also put on flesh. Non-nitrogenous material was chiefly used up in the work. Even in fasting dogs the increased metabolism during work is due almost entirely to the breaking up of non-nitrogenous food, *i. e.*, fat in this case. The same amount of muscular work needs approximately the same amount of chemical energy, whether it comes from proteid, fat, or carbohydrate, *i. e.*, the food-substances yield muscular energy in isodynamic relation.

Hill and Nabarro⁵ find by an examination of the blood-gases that the metabolism in the resting brain is proportionally far less active than in the resting muscles. While the excited muscle shows a great increase of metabolism, the metabolism of the brain is so little affected during activity (epileptic convulsions) that the authors speak in guarded terms of the apparent increase which they detected. They point out that these results are not in accordance with those of Mosso on heat-formation in the brain. [And, indeed, Mosso's conception of the central nervous system as the seat of an active production of heat is opposed to the experiments of various observers. The compiler of this article, for example, has found that cocain does not produce any rise of temperature in a dog whose muscles have been cut out by curara, as was first stated by Richet and Langlois and afterward denied by U. Mosso.]

¹ Verh. d. Berl. physiol. Ges., Arch. f. Physiol., 1895, p. 382.

² Arch. f. exp. Path. u. Pharm., xxxiii., p. 318. ³ Arch. f. Physiol., 1895, p. 242.

⁴ Verh. d. Berl. physiol. Ges., Arch. f. Physiol., 1894, p. 541.

⁵ Proc. Physiol. Soc., March 16, 1895, Journ. of Physiol., xvii.

ANIMAL HEAT.

Nebelthau¹ has measured the heat-loss in fasting rabbits in fever and in the normal state. His chief conclusions are: 1. In fever there may be an increase both of production and loss of heat. 2. There is as yet no proof that fever is ever due to retention of heat alone. 3. During the advance of the fever there are greater variations than normal in the hourly heat-loss. 4. The regulation of temperature is not wholly abolished in fever. 5. The normal proportion between the amount of heat lost by evaporation of water and by radiation and conduction is not altered in fever.

Pembrey, Gordon and Warren,² estimating the variations in the production of carbonic acid caused by changes of external temperature, find that for the greater part of incubation the chick behaves like a cold-blooded animal. Toward the end of incubation there is a sort of neutral stage. After the chick is hatched it behaves like a warm-blooded animal. On the other hand, the frog, although an animal of variable temperature, possesses, according to Vernon,³ the rudiments of a heat-regulating mechanism. The amount of carbonic acid given off varies only within narrow limits when the animal is gradually warmed from 2° to 17.5° C., but above this it increases greatly with rise of temperature. Curara or injury to the spinal bulb abolishes the regulation, and then the production of carbonic acid varies simply with the temperature.

Krans⁴ compared the *temperature of the rectum* with that of the deeper layers of the subcutaneous tissue in sound and febrile individuals by means of thermo-junctions. When the person is lightly clothed the difference of temperature remains approximately constant, but becomes greater as soon as he is stripped.

Laveran⁵ attempted to elucidate the cause of *sunstroke* by observing the effect of high temperatures on dogs at rest and doing work. The latter were much sooner and more seriously affected, and the rectal temperature rose more rapidly. At death the temperature in the rectum was always at least 45.5° C. As to the cause of death, it was not due to coagulation of myosin nor to asphyxia. The heart sometimes began to beat again after the chest was opened; but transfusion of blood never restored the animal. The only explanation of the fatal result seemed to be the action of heat on the nervous system, perhaps paralysis of the ganglia of the heart, etc. [Physiologists do not now, however, attribute as much importance to the ganglia in the maintenance of the beat of the heart as was at one time the case.]

Semon⁶ has measured in Australia the temperature of several specimens of *Echidna*, one of that very peculiar group of mammals, the Monotremes.

¹ Zeitsch. f. Biol., 1894, p. 293.

³ Ibid., p. 277.

⁵ Bull. de l'Acad. de Méd., 3, xxxii., p. 501.

² Jour. of Physiol., xvii., p. 331.

⁴ Wien. klin. Woch., 1894, p. 229.

⁶ Pflüger's Archiv., Bd. lvi., p. 229.

Unfortunately, he was compelled to use very rough methods. In the cloaca the temperature varied from 26.5° to 30.5° C. in three adults. In a young *Echidna*, still in the pouch of the mother, the temperature was 34.2° C.

GLANDULAR ACTION.

Suprarenal Capsules.—Oliver and Schäfer¹ have continued the work previously reported by them,² and now give a more complete account of the action of extracts of the suprarenal capsules of the calf, sheep, dog, cat, guinea-pig, and man, prepared with water, alcohol, or glycerin. The effects produced by injection even of small quantities of such extracts into the veins of a dog are: 1. Great contraction of the arteries. The volume of a limb or a kidney of the animal is found by the plethysmographic method to be diminished. 2. Rapid rise of arterial pressure, in spite of marked inhibition of the heart. The pressure rises still more when the vagi are cut. 3. The inhibition, of central origin, causes complete standstill of the auricles for a time. On section of the vagi, there is great augmentation of the action both of auricles and ventricles. When the extract was injected continuously, these effects were maintained during the whole time of injection without causing death. The active substance is, the authors believe, contained only in the medulla of the gland, not in the cortex. It is not destroyed by gastric digestion, a fact on which some stress is laid, in view of the possibility of its introduction into practical medicine. An extract of the capsules in a case of Addison's disease contained none of the active substance. The authors believe that the function of the suprarenals is to secrete a substance, probably of great physiologic importance for maintaining the tonicity of the muscular tissues in general, and particularly of the heart and arteries.

Pancreas.—Gottlieb³ has examined the effect of various drugs on the rate of secretion and the solid residue of the pancreatic juice in rabbits. The secretion is to a great extent independent of the blood-pressure, and still goes on in the narcosis of chloroform or chloral in spite of the great diminution of pressure. Strychnin stops the secretion, as does stimulation of the central end of the vagus. Pilocarpin increases the rate of secretion as well as the total solids. Atropin has no effect. Excitants like oil of mustard, introduced into the alimentary canal, increase the secretion, while the percentage of solids is diminished.

Pyloric Glands.—Savas⁴ has seen in the cells of the pyloric and Brunner's glands in fasting dogs numerous granules, which blacken with osmic acid and easily dissolve in ether or xylol. He, therefore, believes them to be fat.

¹ Proc. Physiol. Soc., Mar. 16, 1895; Jour. of Physiol., xvii. ² Ibid., Mar. 10, 1894.

³ Arch. f. Exp. Path. u. Pharm., xxxiii., p. 261. ⁴ Centralbl. d. Physiol., June 29, 1895.

Small Intestine.—Miura¹ points out that the ferment which inverts cane-sugar is not a product of bacterial action, and need not come from the food, as various observers have supposed; for it is found in the small intestine of newborn children, which is free from bacteria.

Frank² has continued his experiments on the **absorption of fatty acids**. After ligation of the thoracic duct 72 per cent. of the fatty acids given is still absorbed from the intestine, as against 95 per cent. in a normal animal. He was unable to determine the path by which absorption took place after ligation of the duct. After a meal of fatty acids there is always to be found in the intestine more neutral fat than during hunger. This, as shown by Hermann and Voit, is excreted into the intestine, not formed there on the spot from fatty acids. Frank suggests that, since in Munk's well-known experiments the amount of neutral fat in the chyle of the thoracic duct is only equivalent to one-third of the fatty acids in the meal, it may all come from the neutral fat excreted into the intestine, and may not be synthesized in the intestinal wall, as Munk supposed.

Amylolysis.—Külz and Vogel³ have reinvestigated the amylolytic action of saliva and pancreatic juice, using the production of osazones by phenylhydrazin as a means of distinguishing the different kinds of sugar. They find that when a small quantity of ferment acts on starch or glycogen for a short time, the production of isomaltose is favored. Maltose and some dextrose are formed by the action of a large quantity of ferment for a long time. Cremer⁴ supplements this work by showing that when glycogen is boiled at a pressure of three atmospheres with dilute oxalic acid, isomaltose and dextrose are formed, but no maltose.

Proteolysis.—Chittenden and Mendel⁵ have obtained, by the digestion of crystallized globulin from hempseed, purer peptone than any yet isolated. In elementary composition and other properties the peptone agrees closely with those previously examined by Chittenden.

Carvallo and Pachon⁶ have succeeded in repeating Czerny's excision of the stomach in a dog. The operation was performed June 22, 1893. They find that the operated dog tolerates putrid flesh just as a normal dog does, contrary to Bunge's theory of the antiseptic function of the gastric juice.

Krause⁷ has made an elaborate investigation of the so-called **saliva of the cephalopods** (*Octopus macropus*). The secretion is strongly acid, gives all the general proteid reactions, digests proteids, especially when rendered weakly alkaline, and thus resembles pancreatic juice in its action, but has no effect on starch. It contains a substance which is a very active poison for many animals, crabs, *c. g.*, and which the *Octopus* employs to kill its prey.

¹ Zeitsch. f. Biol., xxxiv., p. 266.

² Archiv. f. Physiol., 1894, p. 297.

³ Zeitsch. f. Biol., 1894, p. 108.

⁴ Zeitsch. f. Biol., 1894, p. 181.

⁵ Jour. of Physiol., xvii., p. 48.

⁶ Archives de Physiol., etc., 1894, p. 106.

⁷ Centralblatt f. Physiol., June 29, 1895.

Kidney.—Meyer¹ finds that if a great part of the blood of a healthy animal is replaced by transfusion of defibrinated blood from a uremic animal, uremic symptoms (dyspnea) do not appear. But if the kidneys of the healthy animal be excised before the transfusion of the uremic blood, the respiration rapidly becomes dyspneic. The author believes that the difference of result cannot be explained merely by the loss of the eliminative action of the kidneys in the second case. He looks upon his experiments as a proof of **internal secretion by the kidneys**. [There are, indeed, many facts that point in this direction.]

Edmunds² points out that saturation of the urine with ammonium sulphate causes a precipitate of ammonium urate, and saturation with magnesium sulphate a precipitate of magnesium phosphate and calcium sulphate. [Certain precautions must, therefore, be taken in testing for and estimating products in urine by methods involving saturation with such salts.]

Garrod³ finds by the spectroscope a trace of **hematoporphyrin** in every one of 20 normal urines examined, although much less than he has found in disease (*c. g.*, in the urine of a patient with heart-disease and nutmeg-liver).

Raphael⁴ examined the action on himself of many **popular diuretics**, and confirmed the diuretic value of milk, milk-sugar, alcohol (in beer and wine), and certain ethereal oils. These are true diuretics, increasing the excretion not only of water, but also of nitrogenous waste-products.

Neumann⁵ found in a case of **osteomalacia** that the patient lost 15.2 g. phosphoric acid by the urine in seven days.

Ovaries.—Curatulo and Tarulli⁶ (under the guidance of Luciani), starting from the fact that women suffering from osteomalacia recover after castration, made experiments on bitches on the effect of removal of the ovaries on metabolism. They conclude that the ovaries, like other glands, have an internal secretion, the products of which favor the oxidation of the organic substances containing phosphorus, from which the bone-salts are derived. Accordingly, after removal of the ovaries more of the organic phosphorus is retained in the body, more calcium and magnesium phosphates are formed, and the bones regain their normal amount of inorganic constituents.

A further contribution to the subject of internal secretion is the observation of Phisalix and Bertrand,⁷ that there exist in the blood of vipers toxic principles analogous to those of the venom itself. The authors believe that the immunity of the viper for its own poison is due to an **internal secretion** by the specific glands of these active principles, which impregnate the organism and so cause tolerance.

¹ Archives de Physiol., etc., 1894, p. 179. ² Jour. of Physiol., xvii., 451–454.

³ Jour. of Physiol., xvii., p. 349.

⁴ Arbeit. d. pharm. Inst. zu Dorpat, x., Stuttgart, 1894.

⁵ Arch. f. Gyn., xlvii., p. 202.

⁶ Centralblatt f. Physiol., May 18, 1895.

⁷ Arch. d. Physiol., 1894, p. 147.

BLOOD, LYMPH, AND CIRCULATION.

Lymph Formation.—[While there is no sign that the battle between the advocates of the theory of the secretion of lymph and the advocates of the theory of physical filtration is, as yet, drawing near an end, a continuous advance in our knowledge of the facts, on which ultimately the decision must be based, has been the fruit of the controversy during the past year. One of the strongest buttresses of the secretion-theory has been the existence of substances, which, when injected into the blood, increase the flow of lymph, without affecting essentially the arterial pressure. Heidenhain divides these so-called lymphagogues into two classes: 1. Substances like peptone, lecch-extract, extract of crayfish, egg-albumin, etc., which cause not only an increase in the rate of flow but an increase in the specific gravity and total solids of the lymph; 2. Crystalloid substances like sugar, salt, etc., which cause an increase of flow of lymph more watery than normal.]

Starling,¹ making public recantation of his previous belief, shows that although it is true that lymphagogues of the second class do not raise the arterial pressure, they do, by attracting water from the tissues and causing hydremic plethora, bring about a marked rise of venous and, therefore,—what is the important thing for the filtration of lymph,—of the capillary pressure. The action of the first class of lymphagogues, which cannot be explained in this way, he attributes to an injurious effect on the endothelium of the capillaries (especially in the liver, since nearly the whole of the increased lymph-flow comes from the liver), which increases their permeability. [This is the weak point in Starling's explanation; and it is not easy to distinguish between an increased permeability of the endothelium produced by lymphagogues and an increased secretive activity.]

Hamburger² has brought forward facts which it is not easy to reconcile with a theory of filtration, even for the second class of lymphagogues, and he asks how it is possible that through a purely physical process of filtration liquid should pass from the tissue-spaces into the capillaries, and at the same time from the capillaries into the tissue spaces. Further, Heidenhain's argument, that since some time after intravenous injection of a substance like sugar a greater percentage of it may be found in the lymph than in the blood, it must have passed into the lymph by a secretive process, receives support from the observation of Cohnstein,³ that when a mixture of crystalloids and colloids is filtered through thin membranes, the percentage of crystalloids in the filtrate is never, at most, greater than in the original liquid. Cohnstein,⁴ however, believes that it is not allowable to compare a sample of lymph with a sample of blood taken at the *same* time, as Heidenhain did. He finds that the *maximum* concentration (after injection of sodium chlorid)

¹ Jour. of Physiol., xvii., p. 30.

² Archiv. f. Physiol., 1895, p. 364.

³ Pflüger's Archiv., Bd. lix., p. 350.

⁴ Pflüger's Archiv., Bd. lix., p. 508.

is about the same in lymph as in blood, although the maximum is, of course, reached later in the former.

Hamburger,¹ experimenting on an analogous subject, finds that even in animals dead for hours the interchange between blood-serum circulated artificially in the vessels and liquid introduced into the peritoneal cavity is essentially the same as in the living animal, and can be explained purely by physical imbibition and osmosis. He concludes his elaborate paper, which contains many other interesting results, by rejecting the view of Starling and Tubby and of Orlow,² that absorption of liquids from serous cavities is a vital phenomenon. But Starling has himself, in a later paper (in conjunction with Leathes)³, brought forward evidence in favor of the physical nature of the process. Orlow's observation,⁴ however, that serum injected into the abdominal cavity of dogs is absorbed in smaller amount when the animals are continuously narcotized by chloroform, does not at first sight, at least, seem to be easily reconcilable with a physical explanation.

It is a well-known fact that when an animal is bled the last portions of the blood are more watery than the first. Hamburger⁵ shows, in opposition to Heidenhain, that this is not associated with any alteration in the proportion of salts in the serum. The osmotic tension remains constant during the bleeding.

Coagulation of the Blood.—Halliburton and Brodie⁶ have continued their work on intravascular coagulation caused by injection of nuclealbumins obtained from various organs (thymus, lymphatic glands, kidney, spleen, testis, etc.), either by precipitating the aqueous extract with acetic acid (Wooldridge's tissue-fibrinogen), or by extraction with sodium chlorid and precipitation with excess of water. In most rabbits, though not in all, injection into the jugular vein of 10–20 c.c. of a solution of the nucleo-albumin in dilute sodium carbonate causes sudden death in a few seconds from the formation of intravascular clot. The authors review the recent theories of coagulation in the light of their own work, and come to the conclusion that fibrin-ferment is not identical with nucleo-albumin. For, among other differences, fibrin-ferment causes no coagulation when injected into the veins, and nucleo-albumin none in shed blood.

Halliburton,⁷ however, has since admitted that fibrin-ferment contains nucleo-albumin, as Pekelharing stated. Although there seems no doubt that calcium is necessary to coagulation, Schäfer⁸ finds that coagulation will occur after a time (some days) even in the presence of excess of oxalates in solution. He supposes that fibrinogen can slowly take up calcium and become converted into fibrin even in the presence of soluble oxalates.

¹ Archiv. f. Physiol., 1895, p. 281.

² Pflüger's Archiv., Bd. lix., p. 170.

³ Jour. of Physiol., vol. xviii., Nos. 1 and 2, May 20, 1895.

⁴ Loc. cit.

⁵ Centralb. f. Physiol., June 15, 1895.

⁶ Jour. of Physiol., vol. xvii., p. 135.

⁷ Proc. Physiol. Soc., Jour. of Physiol., vol. xvii., p. viii.

⁸ Proc. Physiol. Soc., March 16, 1895, Jour. of Physiology, vol. xvii.

Chemistry of Blood.—Lelmann¹ confirms Zuntz's observation that the alkalinity of serum is increased by treating the defibrinated blood with CO_2 before separation of the serum, and shows that the increase is partly due to the passage of alkalis from the red corpuscles to the serum and of Cl from the serum to the corpuscles, under the influence of CO_2 .

Hamburger² finds that under the influence of CO_2 sugar and fat (and proteid, as he previously showed) pass from the corpuscles into the serum, and under the influence of O_2 pass from the serum into the corpuscles. The plasma of blood from the jugular has more alkali, proteid, fat, and sugar than blood from the carotid. He sees in these facts an arrangement that favors oxidation of food-substances. In the pulmonary capillaries the blood takes up O_2 , and, therefore, food-substances in the plasma go over into the corpuscles, where the conditions for oxidation are favorable. In the systemic capillaries the blood takes up CO_2 , and therefore the corpuscles give up proteids, etc., to the plasma, which, accordingly, has here a greater supply of food-substances to offer to the tissues than the plasma of arterial blood itself. [But there is strong evidence that only a trifling amount of oxidation goes on in the corpuscles, and this is a formidable difficulty in the way of Hamburger's theory.]

Loewy³ states that "laked" blood—*i. e.*, blood in which the red corpuscles have been broken up and in which the hemoglobin is in solution in the plasma—has a higher alkalinity than unlaked blood, unless a long time is allowed in the case of the latter for the alkali to reach the acid used in titration. He, therefore, recommends that the blood should be laked by running it into a 0.2 per cent. solution of ammonium oxalate before the alkalinity is determined.

The red corpuscles, according to Lackschewitz,⁴ have the power, while still within the vessels, of taking up large quantities of water, when the blood is diluted by injection of normal salt solution.

Menzies⁵ finds that by the action of various acids on hemoglobin, methemoglobin is first formed, and then hematin. Hemochromogen, derived from hematin by reduction with Am_2S , is reconverted into hemoglobin on being mixed with some of the proteid which splits off from hemoglobin on treatment with dilute mineral acids. [This conclusion, however, is based merely on spectroscopic investigation, and needs confirmation by other methods.]

Gréchant⁶ finds a trace of a combustible gas (probably hydrogen) in normal blood.

Morphology of Blood and Lymph.—Kanthack and Hardy⁷ in a

¹ Pflüger's Arch., Bd. lviii., p. 428.

² Arch. f. Physiol., 1894, p. 419.

³ Pflüger's Arch., Bd. lviii., p. 462.

⁴ Pflüger's Arch., Bd. lix., p. 61.

⁵ Jour. of Physiol., vol. xvii., p. 402.

⁶ Archives de Physiol., 1894, p. 620.

⁷ Jour. of Physiol., vol. xvii., p. 81.

remarkable paper on the wandering cells of the body classify them as follows :—

- | | | |
|---|---|---|
| I. <i>Oxyphile</i> (granules staining with eosin). | { | 1. Coarsely granular (abundant in lymph, scanty in blood).
2. Finely granular (abundant in blood, absent from lymph). |
| II. <i>Basophile</i> (granules staining with methylene blue). | { | 1. Coarsely granular (absent from blood, abundant in lymph-spaces).
2. Finely granular (scanty in blood, absent from lymph). |
- III. Hyaline cells (free from granules) (present both in blood and in extravascular spaces).
- IV. Lymphocytes, or immature cells (present both in blood and lymph).

Vasomotor Nerves.—Bayliss and Starling¹ find that the vasoconstrictor fibers for the branches of the portal vein in the liver (first discovered by Mall) leave the cord in the third to the eleventh dorsal nerve-roots.

Lauder Brunton and Tunnicliffe² have studied the effects of massage of muscles on the circulation. The flow of blood through the muscles is increased. If the massage is extensive the arterial blood-pressure falls. The respiration is markedly accelerated.

Influence of Gravity on the Circulation.—According to Hill,³ if a dog be fastened to a holder arranged in such a way that the animal can be placed vertically, with the head up or down, the blood-pressure in the carotid will fall in the feet-down position and rise in the feet-up position. The effect of change of position is partially compensated by constriction or dilatation of the abdominal blood-vessels brought about through the splanchnic vasomotor nerves. But deep anesthesia, especially with chloroform, and injuries to the spinal cord abolish or lessen the compensation, and then the influence of gravity asserts itself unchecked. So great may the fall of pressure be in a chloralized dog in the feet-down position that death may occur. In animals to which the upright position is normal (monkey) and in man the compensation is practically perfect; but it is affected by drugs and by injury just as in quadrupeds. The author believes that these facts have an important bearing on the causes of death under chloroform, which he finds, in agreement with MacWilliam, and against the conclusions of the Hyderabad commission, may occur from vasomotor paralysis and damage to the cardiac muscle, as well as from respiratory failure.

Heart.—Hofmann⁴ concludes that the fibers of the vagus that influence the force of the contractions of the ventricle run in the auricular septum (in

¹ Jour. of Physiol., vol. xvii., p. 120.

² Jour. of Physiol., vol. xvii., p. 364.

³ Proc. Roy. Soc., vol. lviii., Jour. of Physiol., xviii., p. 15.

⁴ Pflüger's Arch., Ed. lx., p. 139.

the frog). The fibers that control the frequency of the heart are not contained in the nerves of the septum.

Zuntz¹ finds that soldiers marching under a heavy load often develop during the march the physical signs of dilatation of the right ventricle and passive congestion of the liver. After a few hours' rest the areas of dulness shrink to their normal size. A considerable time elapses before the pulse-rate becomes normal. The sphygmogram shows, as the first sign of severe fatigue, a lengthening of the systole in spite of increased frequency.

RESPIRATION (INCLUDING SPEECH).

Porter,² in a very thorough investigation, elucidates the path of the respiratory impulses from the bulb to the phrenic nuclei. He commences by showing that inhibition of hypothetic respiratory centers in the cord by the shock of operations can not be accepted as the explanation of the cessation of respiratory movements when a section is made at the lower limit of the respiratory center in the bulb. For while hemisection of the cord above the phrenic nuclei generally (not always) arrests the movements of the diaphragm on the same side, the movements again appear so soon as the phrenic nerve of the opposite, uninjured side is cut. Accordingly, the respiratory movements cease when the bulb is completely cut off from the cord, not because automatic spinal centers are inhibited, but because they do not exist. The impulses descending from the respiratory center in the bulb to the phrenic nuclei can cross to the opposite side of the cord at the level of the phrenic nuclei, and only there.

Langendorff and Oldag,³ considering the uncertainty of the result on the respiratory movements of stimulation of the vagus in the usual way with induction-shocks, have reinvestigated the matter with the voltaic current. They find that expiratory standstill or slowing is constantly caused by the closure of an ascending current and during its flow. Inspiratory standstill, or quickening, is always caused by descending interrupted voltaic currents.

Boruttau,⁴ entirely confirms these results, although he does not agree with the explanation given by the authors.

Loewy⁵ finds that the amount of oxygen taken in and CO₂ given off by a man is, within very wide limits, independent of the compression of the air breathed or the amount of oxygen in it.

Spencer⁶ has investigated by chemical methods the relation of the degree of anesthesia produced by ether to the percentage of ether vapor in the air inhaled. His results agree very closely with those of Snow and Dreser,

¹ *Verh. d. Berl. physiol. Ges., Arch. f. Physiol.*, p. 378., 1895.

² *Jour. of Physiol.*, vol. xvii., p. 455.

³ *Pflüger's Arch.*, Bd. lxx., p. 201.

⁴ *Pflüger's Arch.*, Bd. lxi., p. 39.

⁵ *Pflüger's Arch.*, Bd. lviii., p. 409.

⁶ *Arch. f. Exp. Pharmac. u. Path.*, 1894.

obtained by physical methods. The dosage of the anesthetic was accurately controlled by a novel and ingenious arrangement attached to a gasometer, in which the mixtures of air and ether were made. 3.5 per cent. of ether vapor was found sufficient to produce complete and harmless anesthesia.

Speech.—Hermann (with Matthias)¹ has continued his investigation of the consonants and vowel sounds by means of his phonophotographic method. (The record of an Edison phonograph is magnified by a system of levers, the last of which carries a small mirror. A beam of light reflected from the mirror falls on a moving drum covered with sensitized paper, so that the movements of the mirror are again exaggerated and photographed.) He concludes that in addition to the tone produced by the vibration of the vocal cords, the pitch of which is of course variable, each vowel possesses one or it may be two tones (produced in the mouth by the intermittent expiratory blast, but not resonance-tones) whose pitch remains constant, or at least varies only within narrow limits.

Pipping² adopts the old view of Helmholtz, that the characteristic tones of the vowels are resonance tones of the oral cavity. Sauberschwarz³ finds that when he cuts out Hermann's fixed ground tones by an ingenious method of interference devised by Grützner, the vowels do not all lose their characters to the same extent, and he therefore supposes that in addition to these fixed ground tones other factors play a part.

NERVOUS SYSTEM.

Head⁴ has published the second part of his remarkable investigations on the disturbances of sensation that accompany visceral disease. In his former research he determined the areas of skin that correspond with various internal organs by observing to what cutaneous regions pain is referred in visceral disease and testing the sensibility of the skin in these regions. He found definite zones corresponding to each organ, the bond of connection between viscus and skin being, as he believes, a common place of origin in the central nervous system of the sympathetic nerves of the viscus and the sensory fibers of the corresponding cutaneous area. In the present paper he extends his observations to the region of the head and neck, which he divides into seventeen zones. For example, there are two zones that correspond to the larynx. The lower laryngeal zone extends from the middle line to the median border of the sternocleidomastoid muscle and downward to the sternoclavicular articulation. In diseases of the larynx, hyperalgesia is present in this zone. When the skin of the zone is stimulated, reflex coughing is often caused. The hyperalgesic zones do not correspond to the distribution of the fibers of the posterior roots of the cervical plexus and the

¹ Pflüger's Arch. Bd. lviii., pp. 255, 264.

² Zeitsch. f. Biologie, 1894, p. 524.

³ Pflüger's Arch., Bd. lxi., 1895, p. 1.

⁴ Brain, xvii., p. 339.

sensory portion of the trigeminus, but to a more central segmental division. [It is impossible to do justice to the paper in a short summary. It will well repay perusal *in extenso*.]

The Nerves of Muscles.—Sherrington¹ finds that in the muscular nerves examined by him from one-third to one-fourth of the medullated fibers have their trophic center in the posterior root-ganglia, and are therefore to be regarded as afferent fibers. Even such nerves as the phrenic, hypoglossal, and recurrent laryngeal contain many such fibers. They have special end-organs in the muscle, the muscle-spindles of authors.

Mott and Sherrington² have investigated the effect on movement and nutrition of the limbs of section of posterior roots in the monkey. They conclude that afferent impulses both from skin and muscles, but especially from the skin, are necessary for the carrying out of the more specialized and skilled movements in which the hand and foot are chiefly used; while associated movements in the limb are not much impaired.

Langley and Anderson³ find that the lumbar nerves contain vasoconstrictor fibers for the bloodvessels of the descending colon and rectum, and also inhibitory fibers for both muscular coats. The sacral nerves supply the same structures with motor fibers. Their experiments lend no support to the theory originated by *v. Basch*, and supported by Gaskell and others, that when an organ has a circular and a longitudinal layer of muscle, and is supplied by two nerves, each nerve sends motor fibers to one coat and inhibitory to the other.

Sympathetic System.—Langley⁴ summarizes his conclusions thus: Each ganglion of the sympathetic trunk is to be regarded as a primary center and in the first place apart from any connection with the spinal cord. The fibers given off by each sympathetic ganglion run chiefly to the corresponding spinal nerve and follow its course. A fiber given off by a sympathetic nerve-cell passes through no other nerve-cell. Spinal fibers that connect cells of the spinal cord with cells of sympathetic ganglia become pilomotor (*i. e.*, supply the erector muscles of hairs), vasomotor, or secretory fibers, according to the destination of the sympathetic fibers proceeding from the cells with which they are connected. Francois-Franck⁵ again asserts that sympathetic ganglia can act as reflex centers, and quotes new experiments in support of his opinion.

Brain and Movements of the Eye.—Russell⁶ has investigated more minutely the representation of individual movements of the eyes in the "eye area" in the frontal portion of the cortex, using monkeys, dogs, and cats. By dividing the ocular muscles that oppose certain movements he has been able to obtain movements of the eyes not hitherto observed on stimulation of the cortex.

¹ Jour. of Physiol., vol. xvii. p. 211.

³ Jour. of Physiol., vol. xviii. 1895. p. 67.

⁵ Archives de Physiol., etc., 1894, p. 717.

² Proc. Roy. Soc., vol. lviii., p. 481.

⁴ Jour. of Physiol., vol. xvii., p. 296.

⁶ Jour. of Physiol., vol. xvii., p. 378.

Sherrington¹ divided the third and fourth cranial nerves on one side in the monkey. External squint of the corresponding eye was of course caused. On stimulating the "eye area" in the cortex, the squint disappeared, owing to an inhibition of the action of the external rectus by impulses descending the abducens nerve. Following up this suggestive experiment, and extending it in various ways, he concludes that in the movements of the eyes graduated relaxation of certain muscles keeps step with graduated contraction of others.

Hodge² publishes some interesting observations on the microscopic differences between the ganglion-cells of old and young honey-bees, and between the cells of the spinal ganglia of an old man and a human fetus. Both in man and in the bee the nuclei decrease in size in senescence, becoming shrivelled and irregular in shape. In young bees the nuclei are large and clear, the protoplasm dense. In old bees the protoplasm is almost absent, and the number of ganglion-cells is greatly diminished.

SPECIAL SENSES.

Hearing.—Ewald³ makes a further communication on the results of complete removal of both membranous labyrinths in the pigeon. He concludes, and Wundt⁴ supports his conclusion, that pigeons in this condition can still hear. In this connection the observation of Fano and Masini,⁵ that in pigeons from which the labyrinth has been removed the respiration is quickened by auditory stimuli, just as in normal birds, is of interest. Bernstein,⁶ however, relying on the experiments of Matte, performed in his laboratory, strongly criticises Ewald's statements. He believes that the apparent reaction to loud sounds is really due to mechanical stimulation of the skin by the sound waves.

Equilibrium.—Lea⁷ continues his investigations on the sense of equilibrium in fishes (common dogfish). "Electrical stimulation of the acoustic nerve produces movements of the eyes and fins that are the algebraic sum of the movements resulting from separate stimulation of the three ampullar branches, and are the exact reverse of the movements following section of the nerve." The movements that follow separate stimulation of the ampullæ or their nerves are the same as the compensatory movements that can be produced by rotating the animal about certain definite axes. He concludes that the semicircular canals are the sense-organs of dynamic equilibrium, that is, equilibrium while the animal is in movement.—Bruck⁸ finds that 52.4 per cent. of deaf-mute children, and only 5 per cent. of normal children

¹ Jour. of Physiol., vol. xvii., p. 27.

² Pflüger's Arch., Bd. lix., p. 258.

⁵ Centralb. f. Physiol., May 18, 1895.

⁷ Jour. of Physiol., vol. xvii., p. 192.

² Jour. of Physiol., vol. xvii., p. 129.

⁴ Philos. Studien, ix., p. 496.

⁶ Pflüger's Arch., Bd. lxi., p. 113.

⁸ Pflüger's Arch., Bd. lix., p. 16.

show abnormalities of locomotion and of equilibrium when tested in various ways. But he agrees with Hensen that experiments on deaf-mutes cannot settle the question of the function of the semicircular canals.

Vision.—The explanation of accommodation given by Helmholtz, and generally adopted in text-books, is being more and more called in question. Tscherning¹ explains accommodation as follows: When the ciliary muscle (which consists of a superficial layer of meridional and a deep layer of radial fibers) contracts, the ciliary processes are drawn back and pull the zonule of Zinn backward and outward. The curvature of the lens is thus altered. In particular, the region round the anterior pole becomes more curved. The contraction of the posterior portion of both layers of the ciliary muscle pulls the choroid forward, and so causes the vitreous humor to press against the posterior surface of the lens and prevent its displacement backward by the pull of the anterior portion of the muscle.

Schoen² believes that the contraction of the ciliary muscle causes an alteration in the curvature of the anterior part of the zonule, which change the lens must follow, as it is always pressed against that portion of the zonule.

Beer,³ in an extended study of accommodation in fishes, finds that most fishes can accommodate *negatively* for a distant object by contraction of a muscle which pulls the lens nearer to the retina. The curvature of the lens is not changed.

Gad⁴ and Hering⁵ bring forward very strong [and, as it appears to us, convincing] evidence against König's assertion that the fovea centralis and the cones in general are blue-blind.

Touch.—Nagel⁶ finds that v. Frey's statement, that only sensations of pain can be elicited from the human cornea and conjunctiva, is incorrect. In addition to pain, both tactile sensations and sensations of cold can be called forth, although, curiously enough, no sensations of warmth.

ELECTROPHYSIOLOGY.

The most important paper on this subject published during the year is that of Burdon Sanderson.⁷ In this he gives a full description of the methods by means of which he and his pupils have done so much for the study of the electric properties of the excitable tissues, along with an account of the main conclusions reached by a comparative study of continuous contraction of muscle and of experimental tetanus. [From the nature of the paper it is not possible to give an abstract of it here. But it may be said that its whole trend—and this is of great interest in connection with the historic

¹ Archives de Physiol., 1894, p. 40.

² Pflüger's Archiv, Bd. lix., p. 427.

³ Pflüger's Arch., Bd. lviii., p. 523.

⁴ Archiv f. Physiol., 1894, p. 491.

⁵ Pflüger's Archiv, Bd. lix., p. 404.

Ibid., Bd. lxi., p. 106.

⁶ Pflüger's Archiv, Bd. lix., p. 563.

⁷ Jour. of Physiol., vol. xviii., p. 117.

development of electrophysiology—is toward the old, and, as many had thought, defunct pre-existence theory of du Bois-Reymond, which is, in a manner, revived, under new and striking aspects.]

Hering¹ maintains his previous attitude of scepticism as to the existence of true internal polarization in du Bois-Reymond's sense. Boruttan² believes that all the electric properties of active nerve can be explained from its properties as a conductor with a core and sheath (Kernleiter).

Hermann³ has extended his experiments on skin-currents and secretion-currents, with the results of confirming his view, that both glandless epithelium and cutaneous glands are the seat of electric differences that give rise to currents.

Schönlein⁴ states that the shock of Torpedo may attain an electromotive force equal to 31 Daniell cells. He does not believe that the relative immunity of the animals to their own shock has been proved.

Ewald⁵ concludes from his experiments that the position taken up by tadpoles in a trough through which a galvanic current is passed (galvanotropism) is not determined by any direct action of the current, but is the position in which they are least stimulated by it. Ludloff⁶ shows that the galvanotropic movements of Paramecium are due to ciliary activity alone.

MUSCLE AND NERVE.

Rigor Mortis.—Nagel⁷ found that frogs' legs in normal saline solution at 37° C. first took up a position of moderate flexion, then in a few minutes became strongly flexed, and in about thirty minutes went into extension. Bowditch some time ago made experiments on the same subject by the aid of graphic and photographic records.

Lever-Action of the Foot.—Ewald⁸ shows that when one stands on tiptoe the foot acts as a lever with two arms, the fulcrum being at the ankle-joint. Renè du Bois-Reymond⁹ points out that this does not necessarily involve the complete abandonment of the older idea of Weber, that the lever is one-armed, with the fulcrum at the toes, which is still correct in certain circumstances and with certain reservations.

Chemical Stimulation of Nerve.—Grützner,¹⁰ using equimolecular solutions (*i. e.*, solutions containing an equal number of molecules of the substances to be compared, in a given volume of solution), has made a series of experiments on the chemical stimulation of sensory nerves. Of the sodium salts of the halogens NaI is the most powerful stimulant, NaCl the least

¹ Pflüger's Archiv, Bd. lviii., p. 133.

² Pflüger's Archiv, Bd. lviii., p. 242.

³ Pflüger's Archiv, Bd. lix., p. 153.

⁷ Pflüger's Archiv, Bd. lviii., p. 279.

⁹ Archiv f. Physiol., 1895, p. 277.

² Pflüger's Archiv, Bd. lix., p. 47.

⁴ Zeitsch. f. Biol., 1894, p. 449.

⁶ Pflüger's Archiv, Bd. lix., p. 525.

⁸ Pflüger's Archiv, Bd. lix., p. 251.

¹⁰ Pflüger's Archiv, Bd. lviii., p. 69.

powerful, NaBr is intermediate. NaI and KCl when applied in solution to the central end of the vagus slow respiration greatly or even cause long expiratory standstill.

REPRODUCTION.

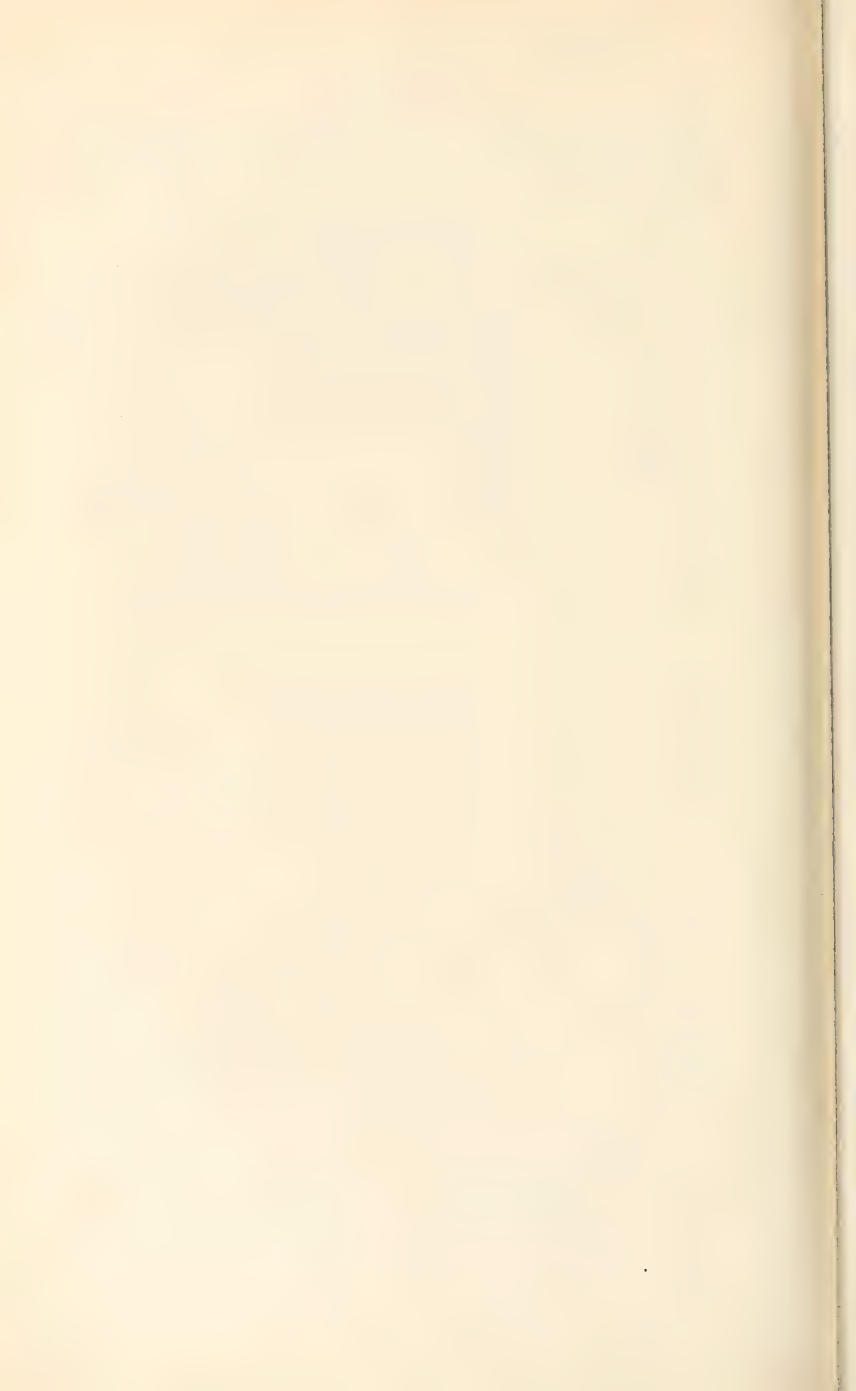
Loeb¹, in an attempt to determine what the smallest proportion of the whole ovum of certain Echinoderms is which will suffice for the development of a normal animal, finds that one-eighth of the whole egg is the minimum. Wilson and Mathews² also obtained normal larvæ from as little as one-eighth of the egg of *Amphioxus*. If the isolation of the pieces was incomplete, double or triple forms were developed.

Hertwig³ and Driesch have shown that the nucleus of the frog's ovum can be made artificially to change its place with reference to the yolk, and yet a normal animal be developed.

¹ Pflüger's Archiv., Bd. lix., p. 379.

² Jour. of Morphol., vol. x., p. 4, Boston.

³ Berl. Klin. Woch., No. 40, Oct. 1, 1894.



HYGIENE AND SANITARY CHEMISTRY—MEDICAL JURISPRUDENCE—CLINICAL CHEMISTRY.

By HENRY LEFFMANN, M.D.,
OF PHILADELPHIA.

HYGIENE AND SANITARY CHEMISTRY.

The Distribution of Disease by Water.—Progress in bacteriology has aided considerably the development of sanitary chemistry, especially as applied to the study of the distribution of disease. The difficulties of securing uniformity in the estimation of bacteria and of isolating definite species from various samples of water have always been great, and have of late attracted so much attention that an effort has been started to secure some uniformity among chemists in this respect. It is to the credit of American sanitarians that they have been early in the field in this matter, and a convention has lately been held, under the auspices of the American Public Health Association, to formulate definite methods for microbe-counting and for isolating special forms. In this connection no subject is of more interest and importance than the specific identity of the bacillus causing typhoid fever. In the earlier history of the application of bacteriology to water-analysis it was too readily assumed that the forms of bacteria were absolutely constant, and too much weight was given to the few characteristics that the experience of observers had so far recorded. It is now apparent that water-bacteria are subject to considerable variability, and it does not seem safe to maintain that there is a specific, constant, differentiated form that is the sole and invariable cause of typhoid fever. More probable is the view that Vaughan has especially advocated, that the ordinary water-bacteria assume temporary conditions, "involution forms," as they are called, and that these give rise to various grades of fever depending on the extent to which the variation has taken place. A microbe designated as the bacillus coli communis, extensively associated with the contents of the intestines of man and domestic animals, seems to have close relationships with the so-called "typhoid bacillus," and, indeed, it has been said by a recent observer that the former in its culture-reactions behaves as if it were well and the latter behaves as if it were sick.

This expression doubtless has a somewhat taking quality by reason of its epigrammatic form, but it is interesting to note that of the most distinct methods recently promulgated for recognizing the so-called "typhoid bacillus" in association with and in contradistinction to the bacillus coli communis, the results with the former are negative; thus the bacillus coli communis curdles milk, produces gas in a glucose culture-medium, and gives the indol-reaction; the other bacillus does not give these reactions. It is obvious that such negative qualities can hardly be satisfactory methods of recognizing a particular form in association with numerous individuals of a more positive character.

Whatever may be the extent of our exact knowledge as regards the transmission of diseases by water, and whatever may be our views as to the specificity of certain microbes, extended experience on a practical scale has shown that the problem of public water-supply is the most important problem in public hygiene, and is one that cannot be treated rationally without a large infusion of engineering knowledge. In most portions of the world, surface water-supplies are the most available, and when these are used in an unrestricted way they are sure to distribute disease. To secure communities from such dangers these supplies must be purified, and it is fortunate that we now have such abundant practical experience as leaves us but little dependent upon theoretic principles for suggestions as to methods.

The Filtration of Water-supply.—In the study of conditions governing the filtration of public water-supplies, the work of the Massachusetts State Board of Health stands most conspicuous. These studies have extended over many years, and have been so fully treated in scientific as well as general literature that it is not necessary in this summary to review them. It is worth while to say, however, that at the latest writing the views of the experts of the Board remain substantially the same as in previous years; among others, Mr. Fuller, the biologist of the Lawrence Station, has recently¹ pointed out the efficiency of simple sand-filtration when applied properly. Among the interesting observations is, that it is probable that pathogenetic bacteria perish early in the filtration, that is, in the upper layers of sand, and that even when a small percentage is found in the effluent these are of forms most usual to the liquid, and which have therefore escaped observation. It appears that a filter cannot be regarded as efficient unless it removes at least 99 per cent. of the bacteria capable of cultivation in some common nutrient medium, *e. g.*, alkaline-meat-extract-peptone-gelatin, at ordinary temperatures. The employment of such systems of filtration at Lawrence, London, Berlin, Hamburg, and Zürich, as well as at many other

¹ "Sand Filtration of Water," G. W. Fuller. Proceedings of the 1894 meeting of the Am. Pub. Health Assn., also the Engineering Record, Oct. 6, 1894. "Filtration of Public Water Supplies," Henry Lefmann. Proceedings of the Engineers' Club of Philadelphia, January, 1895.

places of less note, has resulted in a marked decrease in the prevalence of zymotic disease. It is important, however, to note that the modern results have demonstrated clearly that no system of filtration can be deemed efficient unless a constant watch is kept upon the character of the effluent. Seasonal and other conditions produce changes in the action of the filter, and if the failure of its function is not promptly advertised to the engineer in charge by the results of bacteriologic examination, injury to the community may result. It is not germane to discuss in detail the evidences of the advantages of filtration, but the comparatively recent statement¹ as to the contrast between Altona and Hamburg during the cholera epidemic of 1892 is very striking. The boundary between these cities is a political one only, the built-up portions being contiguous, but the former was supplied by filtered Elbe water, the latter by the unfiltered water. The plotting of the cholera deaths by residence, with a due allowance for the fact that some residents of Altona worked in Hamburg, shows a remarkable difference in favor of the district using filtered water. As the means of collecting such data increase, the number of instances will reach to such a figure that everyone will appreciate the necessity of proper treatment of public water-supplies.

Purification of Water and Sewage by Electricity.—Within the past year some attention has been given to electric methods of purification. These depend upon the electrolytic action of the current, and the principle has been applied to the purification of sewage and to the production of disinfecting solutions from sea-water. Drown² has investigated the method in some detail, and points out that when electric currents are passed through water containing appreciable amounts of common salt, there is formed a considerable proportion of sodium hypochlorite, which has strong deodorizing and disinfecting qualities. It does not seem likely that these processes can be applied to the purification of ordinary water-supplies, but their application to the purification of sewage seems to be worthy of investigation.³ Much good might be done in preserving the purity of streams draining large areas if each community using such stream as a receptacle for its sewage were obliged to submit the latter to some purification that would remove the dangerous ingredients, and an electric method might serve the purpose. The application of the electric method to the process of disinfecting liquids on a large scale was utilized not long ago in one of the larger American cities, near which an island had been set apart to receive the city garbage. This garbage had become intensely foul, the odors being carried to neighboring points. By means of an electric plant large quantities of electrolyzed sea-water were pumped upon this garbage, and it was completely deodorized and disinfected.

¹ "Mitth. aus d. Kaiser. Gesundheitsamt," 1894.

² "The Electrical Purification of Water," by Thos. M. Drown, *Jour. of the N. E. Water Works Assoc.*, vol. viii., No. 4.

³ "The Hermite Process," *Am. Jour. Med. Sci.*, Oct., 1894, p. 496.

Air.—Obviously the study of the sanitary chemistry of the atmosphere is closely associated with bacteriologic work, and here, as in the case of water-analysis, we meet with great practical difficulties, not the least of which is that of sampling. The chances of detecting a particular specific bacillus in a large volume of air are not great. Moreover, it is curious to note that in spite of the extensive studies that have been made upon the atmosphere for many years, we have just learned of the existence of a notable proportion of an hitherto unknown form of matter, and while it is not expected that this new element, argon, has any sanitary relations, we cannot be sure on this point, and some future sanitarian may show that the gravest influences on public health are exercised by variations in this ingredient.

Sewer-gas and Illuminating-gas.—Among the interesting questions that have arisen in regard to the sanitary relations of the atmosphere have been those bearing on its pollution with the emanations from decomposing organic matter. Under the comprehensive but erroneous term, "sewer-gas," a great variety of these emanations is included. It is of the greatest importance to note that there is no characteristic gaseous body to which the term sewer-gas can be applied. If we desire to specify collectively the substances existing in drains and sewers, we can only do so under the term sewer-air. It must further be borne in mind that in all cities provided with a system of sewers and methods of distributing illuminating-gas leakage will occur constantly, by which the illuminating-gas will enter the sewers and soil-pipes and produce dangers that might almost be classified as acute and chronic, and that deserve the attention and appreciation of the physician. In the first place, the atmosphere of a sewer, however foul, never of itself becomes explosive. Sewer explosions are invariably due to the entrance of some combustible gas, principally, as noted, of illuminating-gas.¹ There is reason to believe that chronic ailments are brought about by the escape of small quantities of illuminating-gas into houses through sewer-connections, and even through direct leakage from service-pipes. No data are at hand to show what may be the effect of the long-continued inhalation of hydrocarbons, except that experience at gas-works and oil-refineries would indicate that these gases are not very dangerous. Experiments made some years ago indicated pretty clearly that a very large proportion of common hydrocarbons (coal-gas) could be mixed with air without producing rapidly-fatal results. Of late years, however, the methods of illuminating-gas manufacture have been materially changed, and the introduction of water-gas has greatly in-

¹ It is pleasant to recall, in the midst of the frequent failures of our courts to appreciate the advances of science, that on this point the Supreme Court of Pennsylvania some years ago has very clearly indicated the law. It was held that if a sewer explodes through the production of gases from the sewage itself the municipality is not liable, for the sewers are for sewage, and for all its attendant evils; but if a sewer-explosion takes place by reason of leakage into the sewer of any gas not properly belonging to sewer-systems, it is evidence of negligence on the part of the municipality, and it should be held responsible.

creased the dangers of air-pollution. Water-gas contains large proportions of carbon-monoxid, the carbonic-oxid of the older chemists. This is a colorless, inodorous, tasteless, nonirritating gas, which may be inhaled in considerable amount without attracting attention. Moreover, it is distinctly cumulative, so that quantities too slight to produce any immediate effect are retained and added to in an insidious manner until serious results occur. These results may either be developed within a few hours in consequence of the escape of illuminating-gas directly into a sleeping-apartment, or, very slowly produced by reason of minute leaks, so as to develop a condition of chronic ailment, they may defy diagnosis. The number of cases of fatal poisoning by illuminating-gas has been vastly increased in this country since the introduction of water-gas, and the history of these cases is that of a chemical asphyxia, which generally resists specific treatment. The inhalation of carbon-monoxid gives rise to glycosuria, and it is an interesting question whether the not infrequent observation of the presence of minute proportions of sugar in the urine can be ascribed to such conditions of chronic poisoning.

The Bacteriology of Sewer-air.—Several contributions upon this subject by American investigators are of interest.¹ It was pointed out in the earlier days of bacteriologic science by observers in Germany and England that the air of ordinary sewers is not rich in microbic life. Ordinarily such air contains mostly the spores of molds and similar organisms. Indeed, on considering the matter, it will be seen that in unventilated sewers the conditions are unfavorable to the existence of much suspended matter in the air. Bacteria develop in moisture; they have no disposition to take on the function of flying-fish and disport in the air above the water, and when such water evaporates they are not likely to be carried away from the spot until they become thoroughly dried, and then in many cases they will perish. In ordinary sewers the walls remain moist, and unless the liquids splash considerably, or unless considerable volumes of ordinary air are forced into the sewers, there will be very little suspended bacteria. These results, proved by the investigators noted, have been repeated in this country, and the general consensus of opinion among those who have paid much attention to the matter is that specific disease is not likely to be conveyed through house-drains. It does not follow, however, that sewer-air is not dangerous. Leaving out of consideration the question of cleanliness, which ought to receive much greater attention in the arrangement of our sanitary surroundings than is given it, it is true, as pointed out, that sewer-air may convey dangerous gases; moreover, the slight exhalations from decomposing materials are irritating to some people, and cannot be entirely safe to any one. While, therefore, these modern investigations will relieve us of the almost superstitious fear which we have had of "sewer-gas," they will not do away with

¹ Proceedings Am. Assoc. Physicians, 1895, Boston Med. and Surg. Jour., June 13, p. 600.

our desire to contrive such reasonable sanitary arrangements for the disposal of refuse as shall prevent us from inhaling exhalations from decomposing material.

Garbage-disposal.—In this connection it may be well to speak briefly of some developments recently in the matter of garbage-disposal.¹ This has been one of the most troublesome of the minor matters in municipal management. It has been questioned whether the disposal should be by wholesale, that is, by collection from house to house by municipal authority, or whether it should be left to each householder to dispose of that produced in his own household. It is obvious that in American cities, supplied with such an abundance of succulent fruits, the quantity of offensive garbage in summer-time will be enormous, and its disposal involves considerable expense and trouble. Many of the larger American cities are collecting and disposing of it by incineration on the large scale. Such a system has been in operation in Philadelphia for about a year, and from personal inspection of one of the largest of these plants I can state that many tons of garbage can be effectually incinerated without offense to the neighborhood other than that which belongs to the handling of so much offensive material. The gases resulting from the combustion do not render the atmosphere offensive. Various forms of appliances for the household destruction of garbage have been patented, and some of them seem to be efficient. They have not, however, come into extensive use, and the disposition in cities to provide collection-systems will be likely to interfere with their extensive adoption of these appliances. An ingenious method of disposing of two classes of house-refuse was suggested at a meeting of the Woman's Health Protective Association in Philadelphia; namely, that the ordinary table and kitchen refuse should be made up into small bundles by wrapping in old newspapers. The latter, acting as a sort of absorbent, make the garbage more manageable and less odorous, and facilitate the handling and burning of it at the incinerating station.

Food.—While much progress in detail as to the adulteration of food and as to the conditions that affect its wholesomeness has been made in the last year, no great step in the solution of these problems has been taken. Food-laws have been passed by some Legislatures; already existing laws have been modified by other Legislatures; enthusiastic prosecutions against certain lines of adulteration have been undertaken with partial success, but the general condition does not present much hope for immediate improvement. Food-adulteration is carried on extensively in all parts of the world. It has reached the level of a science; experts are engaged in devising new methods of adulteration, or means of eluding the tests used for recognition of already-existing forms. Substitute-foods, that is, articles that imitate but do not represent standard food-products, are becoming more and more common. It will be sufficient here to indicate the status in regard to some of the

¹ Discussion, N. Y. Acad. of Med., Am. Medico-Surg. Bulletin, Jan. 1, 1895, p. 20.

more important food-products, and among these of prime importance is milk.

The Adulteration of Milk and the Communication of Disease by It.—That milk is subject to extensive adulteration is only too well-known. The fat may be abstracted and water added, and it may be treated with various articles, either to conceal its inferiority or to prevent its decomposition. All these forms of interference have received legislative attention, and the means of detecting them have been the subject of chemical inquiry. It is, however, now recognized that a far more important question in public hygiene is the possibility of the conveying of specific disease through milk. We now note that the dangers from this source fall principally into two classes: first, that due to contamination from specific microorganisms, from disease, either among the milk-yielding animals or among persons about the farm. Of the former type tuberculosis is at present recognized as the most important. Whether more persistent and exact inquiry will indicate the wide distribution of other diseases by this means can not be positively stated, but we may anticipate some startling results in this direction. That tuberculosis is intimately associated with the cow can not be doubted. Observers of large experience have for years asserted that this disease has primarily been introduced into the human race by association with dairy-cattle, and is continued largely through this means, but this view must be regarded as yet not absolutely established. There can be no doubt, however, that tuberculosis is conveyed both through the meat and milk of these animals, and that the recent movements toward exterminating the disease in the dairy are well-directed efforts in public hygiene. Commissions to investigate this topic have been appointed in various countries and by various States of this Union, and elaborate reports¹ have been presented to the Governments of the United States and England confirming the views noted. The last annual (1894) Report of the State Board of Health of New York devoted much space to this topic, and many other States are giving attention to it. The progress of science is materially assisted by the invention of new methods of research. In this way hitherto unknown fields of knowledge are opened up with great rapidity. This fact is shown by the recent applications of **Tuberculin**. Originally proposed as a therapeutic agent, and still believed by some to have value in this respect, this preparation has come to be of the greatest usefulness in the diagnosis of tuberculosis in the lower animals. All observers seem to be in accord upon this point, though naturally with somewhat differing degrees of enthusiasm. It may be regarded as settled that no inspection of herds can be considered properly done unless

¹ Boston Med. and Surg. Jour., 1894, p. 545. "Report of British Royal Commission on Tuberculosis," Abstract in Bost. Med. and Surg. Jour., 1895, p. 498. Also, "Investigations Concerning Bovine Tuberculosis," Bureau of Animal Industry, U. S. Dept. of Agriculture Bull. No. 3.

the careful use of tuberculin has been resorted to. It has been asserted that the employment of this remedy gives rise to tuberculosis in very susceptible animals, or develops what would have been a latent and stationary condition into an active one. Even if true, these objections can not be regarded as serious. Applied to a human being, such an objection would be most momentous, but in the examination of dairy-cattle we want such a test as shall thoroughly eliminate every susceptible animal, and develop by this principle of artificial selection a race more or less insensitive to the germ of tuberculosis. An official preliminary notice of the forthcoming "Annual Report of the Pennsylvania State Experiment Station" gives information that the investigations conducted by Dr. Leonard Pearson have indicated that tuberculin does not produce disease in healthy animals.

Of the second class of diseases conveyed by milk, **Typhoid Fever** is the most important. On this point we have unfortunately too many established incidents; too many cases of serious epidemics originating through infection of milk. This generally occurs by some farm-hand becoming infected with the disease, which is then conveyed either directly to the milk by those engaged about the farm being also engaged in attending upon the patient, or indirectly through contaminated water. Several such epidemics have been noted in Massachusetts and New Jersey.¹

The whole question of milk-inspection and of the improvement in the quality of milk-supply is in a transitional stage, but enough is known at present to justify the remark that the production of cow's milk for human food under the present methods of collection and use is one of the most dangerous of human industries.

Bread.—Some attention has been paid lately to the conditions affecting the wholesomeness of bread. The influences of bad flour, especially that affected by fungi; of mineral adulterants, or of various additions to produce self-raising properties have been long discussed, and nothing novel can be presented. It has been pointed out that the sanitary surroundings of bakeries are often of very inferior character. Many of them are located in cellars, damp, dark, badly ventilated, and infested with vermin, and the workmen occupied during long hours, and therefore not likely to be cleanly or careful in their work. The liability therefore of the affection of the dough by microorganisms is very great. This, indeed, has been recognized for a long while; it has more than once been said that bread is very literally made by the "sweat of the brow." It has generally been thought that any actual infection is prevented by the subsequent baking. Investigations, however, made lately in England² with careful bacteriologic culture of various parts of loaves, have shown that bread is not by any means sterilized, and it appears, therefore, that sanitary inspection needs to be developed

¹ Med. Rec., Feb. 9, 1895, p. 165; idem, May 4, 1895, p. 562.

² Brit. Med. Jour., Aug. 18, 1894, p. 355.

in this direction. In fact, there can be little doubt that bread is an article that should be produced on a large scale with the application of machinery to such an extent that the materials are never handled by human beings until the loaf is finished. This is now perfectly feasible, both as a chemie and mechanic operation.

Butter.—Concerning the adulterations of butter, there is not much novelty. The great substitute, oleomargarin, is still pushing its way into every community, in defiance of every expedient of law, from the most gentle regulation by a light tax to the most severe penal statutes. Various modifications have been introduced into its manufacture to cheapen the product or make it more marketable. In these improvements the manufacturers have not considered the welfare of the community, but merely their own pockets. It has been shown by several observers that genuine butter contains large proportions of microbes, and the bacillus tuberculosis has been found by several observers in samples of commercial butter. To a limited extent butters highly adulterated with water and with curd are sold, but these are not of sufficiently frequent occurrence to attract much attention.

MEDICAL JURISPRUDENCE.

This department of medical science, having close connection with law, partakes largely of the stability and slow development of the latter. A summary of progress, therefore, for the past year would consist largely of a recital of reported cases of the confirmation of established principles by courts, and of some discussion of the efforts of medical men to secure amendment in the attitude of the law toward medical questions.

Some of the important works deserve attention. Several manuals of medical jurisprudence and toxicology intended as text-books or for general reading by practising physicians have appeared, and require no special review here.¹ An important work is that issued under the editorship of Messrs. Witthaus and Becker.² This work is intended to be a comprehensive discussion of the whole subject of the relation of Law and Medicine, adapted to the use of the expert in both professions. A somewhat smaller work in two volumes under the editorship of Dr. Allan McLane Hamilton³ has also appeared.

¹ "Medical Jurisprudence and Toxicology," J. J. Reese, M. D., revised by Leffmann. Philadelphia, P. Blakiston, Son & Co. "Forensic Medicine and Toxicology," J. Dixon Mann, M. D. Griffin & Co., London. "The Principles and Practice of Medical Jurisprudence," A. S. Taylor, M. D., revised by Thos. Stevenson, M. D. London, J. & A. Churchill.

² "Medical Jurisprudence, Forensic Medicine, and Toxicology," edited by R. A. Witt-haus, A. M., M. D., and Tracy C. Becker, A. B., LL. B. In four vols. New York, Wm. Wood & Co.

³ "A System of Legal Medicine," edited by Allan McLane Hamilton, M. D. New York, E. B. Treat & Co.

The Work of Dr. Max Nordau.—Though contributed as a work in general literature, yet as written by a physician and bearing upon the broad question of mental science, the recent contribution of Dr. Max Nordau¹ deserves comment. The attention attracted to it in English-speaking countries has been due to the appearance of a translation. It deals with a phase of human action that is intensely interesting, and it will be scarcely possible to pass a positive judgment upon it as yet. In the current medical literature, however, we notice many statements by physicians who have to deal with mental disease, tending to show a fear that the stress of civilized life is developing a condition of nervous debility which is leading to a great variety of eccentricities. In a certain sense Lombroso and Nordau have but told us in detail what has long been suspected,—that genius may be associated with irregular mental development.

It is rather singular that so shortly after the publication of an English translation there should have been so startling a confirmation of Nordau's diagnosis in the social, moral, and mental collapse of a well-known English literary and artistic personage.

Lombroso.—Nordau's work is interesting to the medical man because it is an extension of the work of Lombroso, whose pupil he was, and while there may be large difference of opinion as to the pupil's extension of the line of investigation, the work of the master deserves much attention.

The most recent contribution of Lombroso that has appeared in English dress is one² discussing various classes of criminal women. It gives numerous measurements showing criminal dimensions; proportions of head, of face; contours of figure; and also some photographic illustrations of facial expressions. A critical opinion upon this work requires the statement that while great credit must be given to the patience with which statistics so difficult to acquire have been collected, and the ingenuity with which facts have been applied, the data are scarcely abundant enough to prove the particular views that the author advocates. Such views may be correct, and may be ultimately established in minute detail, but there is much difference between accepting them as the results of one's familiarity with the data upon which they have been based, and compelling their acceptance by even an intellectual public which only knows them by recital. Several works have appeared lately embodying efforts to trace the origin of crime, but none of them has given a certainty of inference. The popular ideas that crime and poverty are caused by ignorance or by the abuse of alcohol, and that prohibitory laws and compulsory education will bring about the reform, are not

¹ "Degeneration," Dr. Max Nordau. New York, D. Appleton & Co.

² "The Female Offender," Cæsar Lombroso and Wm. Ferrero. New York, D. Appleton & Co.

confirmed by careful statistical inquiry,¹ and the medical profession will look with suspicion upon extreme enactments in this respect.

Expert Testimony.—The relations of expert testimony have been freely discussed of late.² The variety of points advocated does not admit of careful valuation or comparison without exceeding the limits here allowed; but it will be of interest to many that some courts have given opinions upon the responsibility of the authorities for the payment of expert fees and the right of courts to summon physicians for examination upon questions involving professional knowledge or skill.³ Unfortunately, the tendency is to the view that the courts have a right to these services, and that it is not necessary to compensate the witness except with the ordinary statutory witness-fees. It has been said, however, that the physician can not be compelled to make investigations, nor to listen to or judge of testimony, but even with this limitation, if the practice were to become general it would be a grievous burden upon the busy practising physician. It is fortunate, therefore, that the issues in cases requiring expert testimony are usually so momentous, and the lines between opposing parties so closely drawn, that neither is willing to call to the stand a professional person without having previously ascertained the tenor of his opinions and secured his friendly attention to the subject.

The Office of Coroner.—Concerning methods of investigating medico-legal cases an important step has been taken in the recent revision of the Constitution of the State of New York. The office of coroner has been abolished. This office is of high antiquity, and, like most ancient methods of jurisprudence, involves conditions that are not in accord with modern civilization. The State of Massachusetts has long carried on its medico-legal work without such an official, employing instead district medical examiners, who view the bodies, investigate the circumstances briefly without the aid of a jury, and refer to the prosecuting authorities such cases as seem to need legal action.

Punishment.—Considerable discussion has taken place as to amendment in the methods of administering punishment. The introduction of humiliating punishments has been advocated by several medical writers; for instance, the employment of the whipping-post as a punishment for such crimes as wife-beating and of castration for rape. These views must be regarded as academic rather than practical. The suggestions for increase in the

¹ "Relations of Disease, Crime, and Vice," W. O. Henry, M. D., *Jour. Am. Med. Assoc.*, March 2, 1895, 303. "American Charities," Amos G. Warner. New York, T. Y. Crowell & Co.

² "Medical Witnesses from a Physician's Standpoint," H. W. Mitchell, M. D., *Med. Rec.*, June 9, 1894, p. 718. "The Rights and Duties of Medical Witnesses," Hon. W. S. Kerr, *Jour. Am. Med. Assoc.*, Jan. 12, 1895, p. 47. "Medical Experts," W. S. Forrest, Esq., *ibid.*, June 16, 1894, p. 916. "Expert Testimony," H. Leffmann, *Bulletin Am. Acad. of Medicine*, June, 1895.

³ "Report on Progress of Law," *American Law Register and Review*, April, 1895.

severity of punishment, or of introduction of special punishments, are so little likely to be seriously discussed by the law-making powers that it will not be worth while to take space in refuting the arguments offered.¹

Toxicology.—In the department of practical toxicology an interesting advance has been made in reference to the employment of potassium permanganate as an antidote for opium and its preparations, especially morphin, and possibly also for other vegetable poisons. The information on this topic is not entirely uniform, although the trend of the cases reported is decidedly in favor of the value of the antidote in its direct action upon such of the poison as remains in the stomach. Dr. Graham Chambers² gives the following as the result of his investigation: "Potassium permanganate in dilute solution, not stronger than 1 gr. to an ounce, may be given by the stomach without danger, but subcutaneously it is poisonous. Grain for grain, it completely decomposes morphin, the decomposition occurring in acid media more rapidly than in a neutral medium. Foodstuffs and acetic acid do not interfere with the decomposition. It is an efficient antidote if taken while the morphin is in the stomach." It can hardly be possible that it can act upon the absorbed poison, even when introduced hypodermically. In the reported cases other methods of treatment have been employed, and it is always difficult to estimate the part that such methods may have in the cure. In connection with the subject of morphin-poisoning it will be appropriate to mention the murder of Mrs. Buchanan, for which her husband was recently executed. In the trial, expert testimony reflecting upon the accuracy of the chemic analysis was produced, and a serious inroad was made upon the value of this testimony. The possibility of mistaking the putrefaction-products (ptomains) for natural alkaloids was then first brought into great prominence in this country. For the past six or eight years this source of error in toxicologic investigations has been discussed in general literature. In Europe the matter has received considerable attention in the courts. A feature of the case which has been developed in this country, especially by the researches of Vaughan, is that in order to obtain ptomains likely to cause error in search for poisons we must bear in mind that the putrefactive processes that corpses undergo are almost always in a limited supply of air. In most of the investigations for producing ptomains the putrefactions have been allowed to go on in a free supply of air, and the products are different. In the Buchanan trial³ it was shown that indol (properly indin), derived

¹ "Corporal Punishment for Certain Forms of Crime," Discussion N. Y. Acad. of Med., Am. Med.-Surg. Bulletin, Feb. 1, 1895, p. 20. "The Sexual Criminal," James Weir, M. D., Med. Rec., May 11, 1895, p. 581. "Asexualization for the Prevention of Crime and the Curtailment of the Propagation of Criminals," F. L. Sim, M.D., Atlanta Med. and Surg. Jour., Sept., 1894, p. 403. "Emasculation and Ovariectomy as a Penalty for Crime, etc.," R. Boal, M.D., Jour. Am. Med. Assoc., Sept. 15, 1895, p. 429.

² The Canadian Practitioner, Sept., 1894, p. 644.

³ "People of the State of N. Y. vs. R. P. Buchanan."

from animal matter decomposing out of contact with air, gives several of the morphin-reactions, and that it is necessary to apply discriminating tests to avoid error. The subject is an interesting one, and very complex, and its discussion in detail belongs to special manuals.

CLINICAL CHEMISTRY.

Tests for Albumin.—One of the most important contributions to this field of medicine is an investigation into the properties of mucin, or, as it is accurately called, "nucleo-albumin," made by Dr. D. D. Stewart.¹ He made his experiments with the commercial nucleo-albumin derived from bile, which is regarded, however, as identical with that occurring in the urine. This substance gives some of the reactions for albumin, and is occasionally mistaken for it. He experimented upon solutions containing from approximately 0.4 per cent. to 0.02 per cent. In the preparation of the solutions the substance was first triturated with a small quantity of diluent, subsequently thoroughly agitated with the total amount, and then boiled for some minutes. By repeated filtration a clear solution can be obtained. A variety of tests was employed: boiling with and without the addition of acetic acid; nitric acid; acetic acid and potassium ferrocyanid; metaphosphoric acid; saturated solution of picric acid, with and without citric acid; Millard's reagent; trichloroacetic acid and mercuric chlorid, with tartaric acid,—a newly introduced reagent regarded of greater delicacy than Tanret's test. With acetic and citric acids all the strengths of the different solutions gave a sharp contact-ring. With nitric acid a reaction occurred which was observable distinctly in a solution too weak to give more than a trifling haze with a simple solution of picric acid. The combination of potassium ferrocyanid and acetic acid gave a reaction entirely indistinguishable from that of serum-albumin. A decided reaction was obtained with a saturated solution of picric-acid, and with the addition of citric acid was indistinguishable in appearance from that produced by serum-albumin. No reaction save a tardily appearing contact-haze occurred with simple picric-acid solution added to a solution of nucleo-albumin approximating .02 per cent., although picric and citric acids still produced a ring. Stewart also found that ordinary filter-paper will communicate sufficient albuminous material to distilled water to give a reaction with the more delicate tests for albumin.

Tests for Sugar.—Some attention has been paid to the comparative delicacy and liability to fallacy of the various tests for sugar. Though many methods of recognizing this substance have been put forward in literature, practical laboratory-work in clinical chemistry is limited to four: the bismuth test, the copper test, the fermentation test, and the phenylhydrazin test: The last one, having very valuable applications in research, has been put

¹ "The Reactions of Nucleo-albumins," D. D. Stewart, *Med. News*, July 14, 1894, p. 29.

forward as superior for practical use in clinical work to the others, and is described in detail in all the standard manuals. Comparative investigation made by myself has shown that the following method is the most satisfactory. Fifty cubic centimeters of the sample are mixed with .75 of a gram of phenylhydrazin hydrochlorid and one gram of sodium acetate, and the test-tube immersed in boiling water for at least an hour. If sugar be present a bright yellow precipitate separates, which under the microscope is seen to consist of tree-like or chestnut-bur forms. The reaction, though delicate, does not seem to be more so than the bismuth-test, nor more positive in its indications. It is valuable as an accessory test, especially to eliminate fallacy from the presence of reducing-substances that may have been introduced by accident or design. The fermentation-test also does not seem to be of value for delicate testing. The problem to be solved in this department of clinical chemistry is some method recognizing with absolute certainty the minutest traces of sugar, and it does not seem that the phenylhydrazin test has solved this difficulty.

Several extended communications have been made by Sir George Johnson¹ who states that uric acid and kreatinin are the causes of the reducing-action observed in normal urine, which action is often supposed to indicate sugar. He advises the employment of the pieric acid test after previous removal of the interfering substances by means of fractional precipitation by mercuric chlorid. The details of the method, which were worked out by George Stillingfleet Johnson, are given in Bloxam's Chemistry, 7th edition.

The Preservation of Specimens has been a matter of some interest, and it appears that one of the best preservatives is chloroform in the proportion of six or eight drops to a fluidounce. The liquid is agitated and the excess of chloroform settles. Samples thus prepared will keep for months in the hottest weather. Samples containing considerable sugar which is already in a state of fermentation will be preserved from further change by this method. Chloroform simulates reactions for sugar with copper sulphate but not with bismuth subnitrate (Boettger's test) nor with phenylhydrazin, nor does it interfere with the action of these tests when sugar is present. Samples preserved by chloroform may be freed from it by boiling, but a distinction between it and any sugar present may be very easily made by employing the two tests just mentioned.

For the preservation of organic urinary sediments, Thos. Harris² advises the use of a solution prepared as follows: The preservative fluid is a solution of potassium acetate saturated with chloroform, and is prepared as follows: Potassium acetate, 60 g.; chloroform, 10 c.c.; distilled water, 1000 c.c.

The potassium acetate is dissolved in a small quantity of the water and the solution filtered; the chloroform is then added to the filtrate, which is

¹ The Lancet, July 7, 1894, p. 11; idem, Jan. 12, 1895, p. 87.

² Brit. Med. Jour., June 23, 1894, p. 1356.

then placed in a stoppered bottle of at least a liter capacity, with about half the remaining quantity of water, and thoroughly shaken for one or two minutes. The remaining portion of the water is then added and the solution again thoroughly shaken and allowed to stand twelve hours. At the end of that time the solution will be perfectly clear, the undissolved portion of the chloroform will have settled to the bottom, and the clear supernatant potassium acetate and chloroform solution is ready for use. It is advisable to leave the portion of chloroform which is undissolved in the bottle so as to maintain the strength of the chloroform solution. The specific gravity of this solution will be found to be about 1030.

Test for Bile-Pigment in Urine.—In a communication from Charité Hospital, Berlin, Henry Roe¹ gives the following method: The sample to be tested is overlaid with a one per cent. solution of iodine in alcohol, care being taken that the liquids mix as little as possible. If bile-pigment is present a grass-green ring will form at the point of contact, while if no such pigment be present no color or only a light yellow will be produced.

Peptonuria.—Robitschek² has examined numerous samples of urine for peptone, and believes that while it occurs as a physiologic condition during the puerperium, its occurrence at other times is indicative of tissue-degeneration, but as a great variety of such conditions is associated with it, the diagnostic significance is slight.

Nitrites.—Professors Max and Adolph Jolles³ have investigated the occurrence of nitrites in urine without obtaining definite results so far as diagnostic indications are concerned.

J. Friedenwald⁴ finds that the 0.5 per cent. alcoholic solution of dimethylamidoazobenzene suggested by G. Toepfer for the estimation of free hydrochloric acid in the gastric juice is more sensitive than either Günzburg's or Boas' test and is almost as sensitive as Leo's test (with calcium carbonate). The reagent does not give reactions with organic acids unless these are present in amount greater than occurs in practice. Friedenwald finds that slips of filter-paper dipped in the solution and allowed to dry are convenient tests for free hydrochloric acid. Dr. D. D. Stewart informs me in a private communication that he uses this test with much satisfaction.

Friedenwald⁵ has also pointed out some advantages of the resorcin test (Boas') in the fact that resorcin is less expensive and keeps better than the phloroglucinol-vanillin mixture. The latter is usually employed, although not more delicate.

The most recent contribution to urinary chemistry is a work just pub-

¹ Am. Medico-Surgical Jour., Oct. 1, 1894.

² Abst. in Am. Jour. Med. Sci., July, 1894, from Zeit. f. klin. Med.

³ Med. Press and Circular, 1894, No. 25.

⁴ Med. Rec., April 6, 1895, p. 431.

⁵ Med. Rec., 1894, p. 430.

lished by Mr. Allen,¹ of Sheffield, the well-known English analyst. This work does not include any reference to the microscopic examinations. It is especially valuable in view of its careful examination of some of the new tests. Among these may be indicated the safranin-test for sugar. Safranin is a coal-tar color which produces a red solution in water. About one part of safranin in one thousand parts of water is a suitable test-liquid. In making up or using solutions of coal-tar colors it must be remembered that they stain the skin readily. The test for sugar is made by mixing equal parts (about 2 c.c. each) of the safranin solution, urine, and solution of sodium hydroxid, and boiling for a few seconds without much agitation, this precaution being taken to prevent too free access of air, which interferes with the reduction. In the presence of sugar the liquid changes to a yellowish color; in the absence of sugar no marked change occurs. Many of the substances that simulate sugar—for instance, creatin, creatinin, chloroform, chloral, and uric acid—are without effect on safranin. I have confirmed this observation as far as regards chloroform and uric acid by the following severe test: A pinch of uric acid and about 5 drops of chloroform were mixed with the requisite quantities of solution of safranin and sodium hydroxid, and the mixture boiled for 20 seconds. Little color-change occurred. One drop of the sample of urine containing 5.8 per cent. of sugar was added, and after a few seconds' boiling the solution was decolorized. Solutions of albumin decolorize safranin slowly.

For the quantitative determination of sugar Mr. Allen speaks very favorably of Gerrard's method, which depends on the use of copper solution containing potassium cyanid. It is a blue liquid resembling Fehling's solution, and is decolorized by sugar without producing a precipitate. The end-reaction is tolerably sharp.

¹ "Chemistry of Urine. A Practical Guide to the Analytical Examination of Diabetic, Albuminous, and Gouty Urine," Alfred H. Allen, F. I. C., F. C. S. Philadelphia: P. Blakiston, Son & Co., 1895.

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